VCX™ Maintenance Guide

VCX™ V7000 IP Telephony Solution

Convergence Application Suite
System Release 7.1

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About This Guide

This guide describes how to maintain 3Com® VCX IP Telephony Solution software. VCX software runs on either the 3Com V6000 or 3Com V7000 server platforms.

This guide describes how to maintain VCX™ IP Telephony Solution components, which include the VCX software services running in standard VCX software configurations.

This guide is for operators and administrators of the system and assumes the reader has a thorough understanding of telecommunications, VoIP technology, database technology, and network and system administration operation. Many tasks require system administrator privileges.

Release notes are issued with some products. If the information in the release notes differs from the information in this guide, follow the instructions in the release notes.

Conventions

Table 1 and Table 2 list conventions that are used throughout this guide.

Table 1 Notice Icons

Icon	Notice Type	Description
	Information note	Information that describes important features or instructions
	Caution	Information that alerts you to potential loss of data or potential damage to an application, system, or device
	Warning	Information that alerts you to potential personal injury

Table 2 Text Conventions

Convention	Description
`Screen displays`	This typeface represents information as it appears on the screen.
`Syntax`	The word "syntax" means that you must evaluate the syntax provided and then supply the appropriate values for the placeholders that appear in angle brackets. Example: To enable RIPIP, use the following syntax: `SETDefault !<port> -RIPIP CONTrol = Listen` In this example, you must supply a port number for <port>.
`Commands`	The word "command" means that you must enter the command exactly as shown and then press Return or Enter. Commands appear in bold. Example: To remove the IP address, enter the following command: **`SETDefault !0 -IP NETaddr = 0.0.0.0`**
Words in *italics*	Italics are used to: ■ Emphasize a point. ■ Denote a new term at the place where it is defined in the text. ■ Identify menu names, menu commands, and software button names. Examples: From the *Help* menu, select *Contents*. Click *OK*.

Related Documentation

These 3Com documents contain additional information about the products in this release that are a part of or support the 3Com Convergence Applications Suite.

The following documents are a part of the VCX IP Telephony Solution:

- *VCX Installation Guide*
- *VCX Maintenance Guide*
- *VCX Administration Guide*
- *VCX Basic Telephone Quick Reference Guide*
- *VCX Business Telephone Quick Reference Guide*
- *VCX Manager's Telephone Quick Reference Guide*
- *VCX Telephone Display Quick Reference Guide*
- *VCX Basic Telephone Guide*
- *VCX Business Telephone Guide*
- *VCX Manager's Telephone Guide*
- *VCX Feature Codes for Analog Telephones Quick Reference Guide*
- *VCX Security Guide*

The following documents are a part of the IP Messaging Module:

- *IP Messaging Module Quick Reference Guide- 3Com Native Interface*
- *IP Messaging Module User Guide - 3Com Native Interface*
- *IP Messaging Module Quick Reference Guide- Traditional Interface*
- *IP Messaging Module User Guide - Traditional Interface*
- *IP Messaging Module Operations and System Administration Guide*
- *E-Mail Reader Application Quick Start Guide*

The following documents are a part of the IP Conferencing Module:

- *IP Conferencing Module Installation Guide*
- *IP Conferencing Module Administration Guide*
- *IP Conferencing Module User Guide*
- *Convergence Center Client User and Administration Guide*

The following documents provide information on products that support this release:

Enterprise Management Suite

- *Enterprise Management Suite Getting Started Guide,* Version 2.3
- *Enterprise Management Suite User Guide,* Version 2.3
- *Enterprise Management Suite 2.3 for VCX 7.1 User Guide*

Digital Gateways

- *V7122 and V6100 Digital User Guide,* Version 4.8
- *V6100 Digital Fast Track Installation Guide,* Version 4.8
- *V7122 Digital Fast Track Installation Guide,* Version 4.8

Analog Gateways

- *V7111 Analog Fast Track Installation Guide,* Version 4.8
- *V7111 Analog User Guide,* Version 4.8
- *V6000 Analog Fast Track Installation Guide*, Version 4.8
- *V6000 Analog User Guide,* Version 4.8

Comments

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VCX Maintenance Guide
Part Number 900-0382-01 Rev AA
Page 25

Please address all questions regarding the 3Com software to your authorized 3Com representative.

1 VCX System Maintenance Overview

The 3Com® VCX IP Telephony Solution delivers reliable, highly-scalable, comprehensive standards-based IP telephony for large enterprises. This chapter provides an overview of the VCX™ system and the steps required to maintain the servers and services in a VCX environment.

This chapter includes the following topics:

- Network-based Telephony
- VCX Software Components
- VCX Hardware Configurations
- VCX Maintenance Tasks
- About VCX Passwords
- VCX File and Directory Name Guidelines

Network-based Telephony

The VCX IP Telephony Solution (referred to in this guide as the VCX system) merges telephony with networking by delivering business telephone service over a data network.

The VCX architecture provides a distributed call processing system using the SIP signalling protocol to establish voice, video, and text sessions between SIP phones and other SIP-compatible devices. The system can be deployed across enterprises in any topology from single-site campuses to highly distributed organizations with thousands of branches.

VCX servers run the VCX operating system and host software components such as the Call Processor, VCX applications (such as IP Messaging), and configuration databases. SIP-enabled endpoints include VCX telephones and gateways which provide user access to the Public Switched Telephone Network (PSTN)

VCX system components can be installed in different configurations according to the features required and the number of subscribers that must be supported. The system configuration determines the tasks you must perform to enable communication between components.

VCX Software Components describes the VCX software components.

VCX Hardware Configurations, describes the two basic VCX configurations, single-site and multi-site systems.

VCX Maintenance Tasks describes the general tasks required to add users, assign phones to users, and enable communication between devices on your VCX system.

VCX Software Components

This section describes the individual software components in a VCX system.

A VCX system includes the following software services:

- **Call Processor** — Performs call processing functions and generates Call Detail Records (CDRs).
- **Authentication and Directory Service** — Performs the following tasks:
  - Authentication:

Authentication (for example, validating a username and password)

Authorization (for example, verifying a user is allowed to make an international call)

User-specific routing or translation (for example, processes a personal speed dial number)

- Directory (routing and translation functions):

  The routing function identifies, selects, and prioritizes all the possible routes for a given call.

  The translation function manipulates the access number as a call propagates through the system.

- **Accounting Service** — Sends, exports, and manages CDRs.
- **SIP Phone Downloader** — Loads an application image on to a 3Com phone, which enables SIP support on the phone.
- **Common Agent** — Connects other software components and the VCX server operating system to the Enterprise Management Suite (EMS) or other SNMP-based network management tools.
- **Provisioning Service** — Provides a web-based user interface for managing authentication and directory data.
- **Call Records Service** — Stores CDRs received from the Accounting Service. Sometimes referred to as the Billing Server.
- **IP Messaging Service** — Provides integrated voice messaging, fax, and e-mail capabilities, and advanced messaging features such as Find Me Follow Me call routing and text-to-speech e-mail reading. Also supports Global Voicemail Integration, which links regional and branch office IP Messaging servers through a universal mailbox directory on a special IP Messaging server called the Global Voicemail Central Server (GVCS).

These components can be installed in various configurations as shown in Table 3.

Table 3 VCX Software Configuration Options

	Standard Software Configurations						
Software Service	**IP Telephony and IP Messaging Server**	**Call Server**	**IP Telephony Server**	**IP Messaging Server**	**Authentication and Directory Server**	**Call Records Server**	**Global VM Central Server**
Call Processor	Yes	Yes	Yes				
SIP Downloader	Yes	Yes	Yes				
Authentication and Directory Services	Yes		Yes		Yes		
Accounting Services	Yes	Yes	Yes				
Provisioning Services	Yes	Yes	Yes				
Common Agent	Yes	Yes	Yes	Yes	Yes	Yes	Yes
IP Messaging Services	Yes			Yes			Yes
Call Records Services	Yes		Yes			Yes	

Depending on the hardware configuration, some services are typically installed in redundant pairs. For example, the Call Processor Service is designed to run on redundant servers so if the primary server fails, the secondary server can take over processing.

However, during installation, specific software services may or may not be enabled in a given software configuration. For example, the Call Records Service is designed to run on a single hardware platform. In single-site configurations, the Call Records Service is enabled on the primary IP Telephony and Messaging or primary IP Telephony server only. In a multi-site system, the Call Records Service is typically enabled on a dedicated server.

VCX Hardware Configurations

This section briefly describes the basic hardware configurations that support VCX systems. Refer to the *VCX Installation Guide* for more information. Because VCX system software can be installed in a wide variety of hardware configurations, you must understand how *your* VCX system has been installed before you configure its components.

There are two basic configuration options, single-site and multi-site systems. The hardware servers in each option type run the VCX operating system. Currently supported hardware platforms include:

- V7000-series systems with IBM X306m or IBM X346 servers
- V6000 Integrated Branch Communications servers
- V6100 Integrated Branch Communications servers

The next two sections describe typical examples of single-site and multi-site configurations.

Single-Site Configurations

This section describes two possible single-site configurations.

- **One Pair of Servers**

  This configuration includes one pair of servers. The primary server and the secondary server both run the IP Telephony and IP Messaging configuration.

  The Call Records Service is enabled on the primary server only.

- **Two Pair of Servers**

  This configuration includes two pairs of servers:

  - Two servers run the IP Telephony software configuration. The Call Records Service is enabled on the primary server only.
  - Two servers run the IP Messaging configuration.

Multi-Site Configurations

Multi-site configurations can be configured in two ways:

- Multiple regional offices, all of which are self-contained but interconnected. Each office includes two servers each running the IP Telephony and IP Messaging configuration. One of the offices also has a Call Records Server which runs on a separate server and provides billing information (CDRs) to all of the offices. There are no branch offices.
- A single regional office that supports one or more branch offices.
- Multiple regional offices, each of which supports one or more branch offices.

  One of the regional offices contains:

  - Two servers running the Call Server configuration

- One or two servers running the IP Messaging services configuration. The number of servers depends on whether the branch offices are configured with IP Messaging services or obtain that service from the regional office.
- One server running the Authentication and Directory Server configuration
- One server running the Call Records Server configuration

The other regional offices contain:

- Two servers running the Call Server configuration
- One or two servers running the IP Messaging services configuration. The number of servers depends on whether the branch offices are configured with IP Messaging services or obtain that service from the regional office.
- One server running the Authentication and Directory Server configuration

- Each branch office can operate with either a single IBM server or a 3Com V6000-series Integrated Branch server.
  - The IBM server can run either the IP Telephony and IP Messaging configuration, or the IP Telephony configuration. The IP Telephony and IP Messaging configuration enables each branch office to have its own (local) IP Messaging service. The IP Telephony configuration requires that each branch office obtain IP Messaging services from the regional office (referred to as global messaging).
  - The 3Com V6000-series Integrated Branch server runs the IP Telephony and IP Messaging configuration which enables local IP Messaging service.

As an alternative to the local or global messaging configuration options, VCX software version 7.1 (and higher) supports Global Voicemail Integration. Global Voicemail Integration links regional and branch office IP Messaging servers through a universal mailbox directory on a special IP Messaging server called the Global Voicemail Central Server (GVCS). When enabled, Global Voicemail Integration allows a user to send, reply to, and forward voicemail messages to any other mailbox in the system. The GVCS does not carry IP Messaging traffic; it acts as a coordinator that monitors mailbox activity (mailbox creation, modification, and deletion) on each IP Messaging server in the system. For example, when a voice mailbox is created on a branch office, the GVCS updates its global directory and notifies all the other offices to update their local directories.

The version 7.1 upgrade procedure allows you to enable Global Voicemail Integration on servers running IP Messaging software. However, you *must* install IP Messaging software on a GVCS, and then set up the GVCS through the IP Messaging administrator configuration interface *before* enabling Global Voicemail Integration on regional and branch office IP Messaging servers. Refer to the *IP Messaging Module Operations and System Administration Guide* for more information and for configuration options.

With VCX software version 7.0 and higher, you can set up IP Messaging in a client/server configuration. An IP Messaging server can support up to 20 IP Messaging clients. One client can be dedicated to non-voice applications such as Web provisioning, e-mail synchronization, and logging. The remaining clients can be dedicated to voice functions. This type of setup diverts the stream of voice traffic and improves the IP Messaging server performance. Clients should be located on the subnet with both management servers or have a minimum of 200 Mbps IP backbone on a dual subnet network configuration. See the *IP Messaging Module Operations and System Administration Guide* for details.

VCX Maintenance Tasks

This section describes the maintenance tasks you may need to periodically perform to, for example, backup a database, add an Accounting service group to the Call Records service, or upgrade your VCX system software.

This section assumes that VCX software has been successfully installed, your network is functioning normally, and that you understand your VCX system configuration (single-site or multi-site).

VCX system communication is based on the Session Initiation Protocol (SIP). SIP is used to set up, maintain, and terminate connections (calls) between end points. These end points are SIP-enabled devices such as telephones, call processors, and gateways. Basically, VCX configuration consists of identifying and configuring the end points in your VCX network, and setting up the rules that govern communication between the end points.

In general, VCX maintenance includes the tasks shown in Table 4. In a multi-site configuration, some of these tasks must be performed at each site (regions and branches).

Table 4 VCX Maintenance Tasks

Task	Purpose	Reference
Configure accounting groups on the Call Records service.	Identifies the Accounting services from which the Call Records service should collect Call Detail Records (CDRs).	Chapter 2
Maintain VCX system servers.	Tasks include: ■ Clearing the Tomcat cache. ■ Modifying a time zone configuration. ■ Stopping and starting various VCX services. ■ Backing up and restoring Authentication and Directory server databases. ■ Managing SNMP station access. ■ Changing a Codec.	Chapter 3
Back up and restore VCX component and operating system configuration data.	Back up all relevant VCX component and operating system configuration data on a machine running one or more VCX services into a single file, and subsequently restore that configuration using the backup file.	Chapter 4
Back up and restore a VCX provisioning data.	Back up provisioning data (for example, user accounts, dial plans, and phone extensions) stored in the VCX Authentication and Directory service database, and subsequently restore that provisioning data using the backup file.	Chapter 5
Configure Multi-Master Replication.	Multi-Master Replication (MMR) is the process of copying and maintaining database tables in multiple databases that make up a distributed database system.	Chapter 6
Reconfigure a VCX server.	Modify the networking parameters and configuration of the services run on a VCX server.	Chapter 7
Manage an Uninterruptible Power Supply (UPS).	Add UPS support to an existing VCX system and monitor UPS status.	Chapter 8
Reconfigure a VCX call processor.	Use the Command Line Interface (CLI) to add trusted end points to a VCX call processor.	Chapter 9
Manage user accounts.	Use the Command Line Interface (CLI) to add, modify, and delete user accounts either manually or in batch mode.	Chapter 10

Table 4 VCX Maintenance Tasks (continued)

Task	Purpose	Reference
Upgrade VCX system software.	Upgrade VCX system software to a later release.	Appendix A, for version 7.0 to version 7.1 upgrades Appendix B for version 7.1.*x* to version 7.1.*y* upgrades Appendix C for version 6.0 to version 7.0 upgrades
Downgrade VCX system software.	Downgrade VCX system software to the last previously installed release.	Appendix D

The tasks in Table 4 are performed by executing commands on the appropriate VCX server. Commands can be executed either locally through a console terminal attached to the server or remotely through a Secure Shell (SSH) session.

See to Appendix E for a description of the VCX commands you can use to manage and view VCX components.

For information on replacing a VCX server disk, refer to the *VCX Installation Guide*.

About VCX Passwords

The commands you execute to perform the maintenance tasks described in this guide require logging in to a server using the appropriate VCX system account. The username and default password for each account is shown in Table 5.

Table 5 VCX System Accounts

Username	Default Password
root	pvadmin
oracle	oracle
tomcat	tomcat
cworks	cworks
vcx	vcx
app	nice

During the VCX installation procedure, the installer has the option to change the default password for each account. 3Com Corporation strongly *recommends, for security reasons, that installers change the*

default passwords. Consult with your VCX installer for the current passwords.

Note that these passwords can be changed after the initial installation by running the `vcx-reconfigure` script. See Chapter 7.

CAUTION: *Do not use operating system commands or utilities to change these passwords. The* `vcx-reconfigure` *script changes the password where necessary in VCX scripts and configurations. Operating system commands and utilities do not.*

VCX File and Directory Name Guidelines

VCX systems adhere to file naming conventions based on Linux and UNIX C shell usage. Files may be created on other platforms such as Microsoft Windows and then transferred to a VCX system. A valid Windows file or directory name may not be compatible with VCX Linux conventions. To ensure that the names of any transferred files are compatible with the VCX conventions, please use the following guidelines:

- File and directory names composed of upper and lower case letters, numbers, hyphens, and underscores are generally valid, but do not begin a name with a hyphen.
- File or directory names can range from 1 to 255 characters.
- File or directory names must not begin with a hyphen or a period.
- Do not use any of the characters listed in Table 6 in a file or directory name:

Table 6 Characters to Avoid in File and Directory Names

Character	Description
/	Forward slash
\	Backward slash
’	Single quotation mark
“	Double quotation mark
,	Comma
*	Asterisk
?	Question mark
[and]	Left and right square brackets
{ and }	Left and right braces
~	Tilde

Table 6 Characters to Avoid in File and Directory Names (continued)

Character	Description
$	Dollar sign
!	Exclamation mark
< and >	Left and right carets
|	Bar
&	Ampersand
;	Semicolon
(and)	Left and right parentheses
#	Pound or hash character
@	At sign
€	Euro sign
	Space and tab characters

2 CONFIGURING THE CALL RECORDS SERVICE

This chapter describes how to configure accounting groups on the Call Records service. An accounting group identifies the Accounting services from which the Call Records service should collect Call Detail Records (CDRs).

This includes the following topics:

- Call Records Service Overview
- Configuring an Accounting Service Group
- Adding Accounting Services to the Call Records Service
- Managing CDRs and Super CDRs
- QoS Monitoring Statistics

Call Records Service Overview

A Call Detail Record (CDR) contains information about a processed call. This information can include the identity of the calling and called parties, the duration of the call, and the type of call. CDRs can be imported by third-party billing platforms to generate billing statements.

In a VCX system, CDRs can be generated by a call processor or by an IP Messaging server.

- Call processor CDRs are collected by one or more VCX Accounting services and then sent to the Call Records service. This chapter describes how to set up this system.
- IP Messaging CDRs are generated and collected by the IP Messaging system. Refer to the *IP Messaging Module Operations and System Administration Guide* for information.

Depending on your VCX system configuration, an Accounting service can run on any of these servers:

- IP Telephony and Messaging Server
- IP Telephony Server
- Call Server

The Accounting service collects CDRs for the server on which it runs, which then provides the CDRs to the Call Records service.

The Call Records service can run on any of these servers:

- IP Telephony and Messaging Server
- IP Telephony Server
- Call Records Server (a standalone server, usually located in a regional office)

A VCX system requires only one Call Records service to manage all the Accounting services. The Call Records service collects CDRs from one or more Accounting services and creates a Super CDR. A Super CDR consists of one or more individual CDRs that have been merged into a single XML file.

The Call Records service organizes Accounting services into groups. Each group can contain one or more Accounting services, but an Accounting service can belong to only one group.

For example, your VCX system could include the following components:

- The East region includes two sites (call processors) each running an Accounting service: SalesE and EngE.
- The West region includes two sites (call processors) each running an Accounting service: SalesW and EngW.

In this example, you could create two Account service groups on the Call Records service. The EastGroup includes the Accounting services SalesE and EngE. The WestGroup includes the Accounting services SalesW and EngW. Alternatively, you could create two Account service groups, Sales and Eng. Sales would include SalesE and SalesW; Eng would include EngE and EngW.

To create reports from individual CDRs or from a Super CDR, use a CDR utility such as the VCX Call Reports application, import the CDRs or the Super CDR, and generate calling usage reports.

Configuring an Accounting Service Group

Each Accounting service must be contained in a group. A group must be created before you can add any Accounting services to the Call Records service. You can configure as many groups as you want for your system, but each Accounting service can only be assigned to one group.

VCX includes one Accounting service group named *defaultGroup*. This group, by default, contains no Accounting services and is disabled.

You can either add Accounting services to the default group, or you can create your own group (or groups) and add Accounting services. You create groups and add Accounting services by running the `config.sh` script on the server hosting the Call Records service.

The `config.sh` *script uses the term "Accounting Server". In all cases, this term refers to the Accounting service running on a VCX call processing server.*

Similarly, the script uses the term "Call Records Server". In a single-site VCX system, this term refers to the Call Records service running on a VCX call processing server. In a multi-site VCX system, this term refers to the Call Records service running on a separate Call Records Server.

Adding an Accounting Group

To add an accounting group:

1. Log on to the VCX server hosting the Call Records service as *cworks* and enter these commands:

   ```
   cd /opt/3com/VCX/bssxml/bin
   ./config.sh
   ```

   A menu of configuration options appears followed by the *SELECT OPERATION* prompt.

2. At the prompt, enter **101**.

   The *Enter Unique Group Name* prompt appears.

3. Enter a descriptive name for your group.

   The new group is created and enabled automatically.

   To list the existing accounting, enter **104** at the *SELECT OPERATION* prompt.

Viewing Configured Group Details

Use this function to list the Accounting services associated with a specific group. This function also shows whether or not a group is enabled and how often it collects CDRs from the Accounting services.

To view group details:

1. Log on to the VCX server hosting the Call Records service as *cworks* and enter these commands.

   ```
   cd /opt/3com/VCX/bssxml/bin
   ./config.sh
   ```

   A menu of configuration options appears followed by the *SELECT OPERATION* prompt.

2. At the prompt, enter **105**.

   The *Enter Group Name to View Details* prompt appears. The configured groups are listed above the prompt.

3. Enter the name of the group you want to view (the name is not case sensitive).

   The group details and associated Accounting services are listed.

Enabling and Disabling Groups

You can enable or disable configured groups. A disabled group stops collecting CDRs from member Accounting services. The CDRs are stored on each server hosting an Accounting service and accumulate as long as there is enough disk space.

When you create a group, it is enabled by default, However, the VCX-supplied Accounting service group named defaultGroup*, is in a disabled state by default.*

To enable or disable an accounting group:

1. Log on to the VCX server hosting the Call Records service as *cworks* and enter these commands.

   ```
   cd /opt/3com/VCX/bssxml/bin
   ./config.sh
   ```

   A menu of configuration options appears followed by the *SELECT OPERATION* prompt.

2. At the prompt, enter **`102`**.

   Either the *Enter the Group Name to Enable* or the *Enter the Group Name to Disable* prompt appears, depending on the state of the group. The configured groups are listed above the prompt.

3. Enter the name of the group you want to enable or disable.

   The *Do you want to* [*Enable/Disable] this Group [y/n]* prompt appears.

4. Enter either **`y`** or **`n`** depending on the state you need the group to be in.

   The new state is applied to the group, and you are returned to the main menu.

Deleting Groups

Once a group is deleted, all Accounting services that are configured to be in that group are no longer associated with anything. Deleted groups will no longer collect CDRs from the Accounting services. The CDRs are stored on the servers hosting the Accounting services and will continue to be stored on the servers as long as there is enough disk space.

To delete a group:

1. Log on to the VCX server hosting the Call Records service as *cworks* and enter these commands:

   ```
   cd /opt/3com/VCX/bssxml/bin
   ./config.sh
   ```

A menu of configuration options appears followed by the *SELECT OPERATION* prompt.

2 At the prompt, enter **103**.

The *Enter the Group Name to Delete* prompt appears. The configured groups are listed above the prompt.

3 Enter the name of the group you want to delete.

The group is deleted. To verify the group is deleted use the list option (**104**).

Adding Accounting Services to the Call Records Service

Accounting services are not automatically associated with a Call Records service. To have the Call Records service collect CDRs from individual Accounting services (to create a Super CDR), you first need to assign the Accounting services to one or more groups (see Adding an Accounting Group), then assign the group to the Call Records service.

If you have a multiple site configuration (includes more than one server), be sure to add all Accounting services to the Call Records server. This includes all the regional offices (primary and secondary) and any branch offices.

To add Accounting services to the Call Records service:

1 Log on to the VCX server hosting the Call Records service as *cworks* and enter these commands;

```
cd /opt/3com/VCX/bssxml/bin
./config.sh
```

A menu of configuration options appears followed by the *SELECT OPERATION* prompt.

2 Enter **201**.

A list of configured Accounting service groups appears followed by the *Enter the Group Name* prompt.

3 Enter the name of the group (the name is not case-sensitive).

*If you choose to add Accounting services to the default, VCX-supplied Accounting service group (*defaultGroup*), you must enable the group. This group is disabled by default.*

The *Enter Unique Source Name* prompt appears.

4 Enter a unique identifier that you want to assign to the Accounting service. For instance, if it is a branch office in Joliet, IL, you could use *branchJolietIL* as the identifier. There is no name length limit for an Accounting service identifier.

The *Enter Source Address* prompt appears.

5 Enter the IP address or hostname of the Accounting service you are associating with this group.

In a multi-site configuration, the Accounting service uses either the eth0 or eth1 network interface and runs on the server that performs call processing. Depending on which Accounting service you are adding, enter the appropriate IP address for these servers:

- ***Regional Office*** *— For the Primary Call Processor Server and Secondary Call Processor Server, use the IP address assigned to eth1 for each server.*
- ***Branch Office*** *— For the IP Telephony and Messaging Server, use the IP address assigned to eth0.*

The *Do you want to use Default Accounting Server Source Configuration* prompt appears. 3Com recommends using the default source configuration, which identifies where the CDRs are stored on the Accounting service.

If you enter **`n`**

a At the *Enter Source Path* prompt, enter the path where you want the CDRs to be stored. The default is */opt/3com/VCX/acctxml/db/export*.

b At the *Enter Source Username*, enter *cworks*.

An asterisk (*) appears at the Password prompts. Enter and re-enter the password for the user (default username is cworks). The 'cworks' in the bracket after the prompt is not the default password. You must enter the correct password for the user. If nothing except the Enter key is given, an empty password is accepted, which is probably not the correct password for that user (cworks) on the Accounting service.

c At the *Enter Password for Username* prompt, enter *cworks*.

d At the *Retype Password for Username* prompt, enter *cworks*.

The new Accounting service is added to the group. You will see a SUCCESS message once it has been added.

- If you enter **`y`**, the source path defaults to */opt/3com/VCX/acctxml/db/export*, which is where the CDRs are stored on server hosting the Accounting service.

a At the *Enter Password for Username* prompt, enter *cworks*.

An asterisk (*) appears at the Password prompts. Enter and re-enter the password for the user (default username is cworks). The 'cworks' in the bracket after the prompt is not the default password. You must enter the correct password for the user. If nothing except the Enter key is given, an empty password is accepted, which is probably not the correct password for that user (cworks) on the Accounting service.

b At the *Retype Password for Username* prompt, enter *cworks*.

The new Accounting service is added to the group. You will see a SUCCESS message once it has been added.

The Accounting service is added to the Call Records service group.

6 Press *Enter* to return to the main menu.

Editing Accounting Service Information in a Group

You can use this feature if you need to update Accounting service information.

To edit Accounting service information:

1 Log on to the VCX server hosting the Call Records service as *cworks* and enter these commands:

```
cd /opt/3com/VCX/bssxml/bin
./config.sh
```

A menu of configuration options appears followed by the *SELECT OPERATION* prompt.

2 At the prompt, enter **202**.

3 The screen displays the number of configured Accounting services. Continue to press *Enter* to view the Accounting services (clustered in their group) until you reach the *Enter Source Name to Update* prompt.

4 At the prompt, enter the name of the Accounting service you want to update.

The *Enter Old Password for Username [cworks]* prompt appears.

5 At the prompt, enter the password for the cworks user after the asterisks (*).

An asterisk (*) appears at the Password prompts. Enter and re-enter the password for the user (default username is cworks). The 'cworks' in the bracket after the prompt is not the default password. You must enter the correct password for the user. If nothing except the Enter key is given, an

empty password is accepted, which is probably not the correct password for that user (cworks) on the Accounting service.

The *Do you want to Update Password* prompt appears.

6 Re-enter the password already assigned for the cworks user. Do not try to change a password here.

The *Update Source Address* prompt appears.

7 Enter the IP Address of the server you need to edit.

The *Update Source Path* prompt appears. The default is */opt/3com/VCX/acctxml/db/export*. This is the location where the CDRs are is stored on the Accounting service.

The new configuration is applied and you are returned to the main menu.

Deleting an Accounting Service from a Group

This option allows you to delete an Accounting service from a group. Once an Accounting service is deleted from a group, any CDRs that are generated will be stored on the Accounting service.

To delete an Accounting service from a group:

1 Log on to the VCX server hosting the Call Records service as *cworks* and enter these commands:

```
cd /opt/3com/VCX/bssxml/bin
./config.sh
```

A menu of configuration options appears followed by the *SELECT OPERATION* prompt.

2 At the prompt, enter `203`.

3 The screen displays the number of configured Accounting services. Press *Enter* to view the Accounting services (clustered in their group) until you reach the *Enter Source Name to Delete* prompt.

4 Enter the name of the Accounting service you want to delete from the group. You are not uninstalling the Accounting service software, you are just unassigning the Accounting service from a group.

5 Enter the password for the cworks user after the asterisks (*).

An asterisk (*) appears at the Password prompts. Enter and re-enter the password for the user (default username is cworks). The 'cworks' in the bracket after the prompt is not the default password. You must enter the correct password for the user. If nothing except the Enter key is given, an

empty password is accepted, which is probably not the correct password for that user (cworks) on the Accounting service.

The *Are you sure you want to Delete this Source* prompt appears.

6 Enter **y** to delete the Accounting service.

The Accounting service is deleted from the group and you are returned to the main menu.

Listing All Configured Accounting Services

Use this option to view all of the Accounting services that are configured for this Call Records service.

To view all configured Accounting services:

1 Log on to the VCX server hosting the Call Records service as *cworks* and enter these commands:

```
cd /opt/3com/VCX/bssxml/bin
./config.sh
```

A menu of configuration options appears followed by the *SELECT OPERATION* prompt.

2 At the prompt, enter **204**.

3 The screen displays the number of configured Accounting services. Press *Enter* to view the Accounting services (clustered in their group) until you reach the main menu prompt.

Viewing Accounting Service Details

Use this option to view which group an Accounting service belongs to, the IP address of an Accounting service, the protocol type used, the port number used, the path where the generated CDRs are located, and the username of the Accounting service.

To view the details of a configured Accounting service:

1 Log on to the VCX server hosting the Call Records service as *cworks* and enter these commands:

```
cd /opt/3com/VCX/bssxml/bin
./config.sh
```

A menu of configuration options appears followed by the *SELECT OPERATION* prompt.

2 At the prompt, enter **205**.

3 The screen displays the number of configured Accounting services. Press *Enter* to view the Accounting services (clustered in their group) until you reach the *Enter Source Name to View Details* prompt.

4 Enter the name of the appropriate Accounting service.

The Accounting service details are displayed and you are returned to the main menu.

Managing CDRs and Super CDRs

Call Detail Records (CDRs) are generated by the call processor and stored on the Accounting service in an XML file format. A Super CDR consists of one or more individual CDRs that have been merged into one XML file. A Super CDR may have part or all of the fields listed in an individual CDR depending on what information was needed during a call. CDRs can be sent to the VCX Call Reports application (see the *VCX Administration Guide*). This application allows you to view, export, and create reports based on retrieved CDRs.

Understanding CDR Fields

Each CDR and Super CDR XML file consists of HTML tags that are used to identify specific variables. See Table 7 for the names of the variables associated with the HTML tags and the CDR field descriptions and values.

Table 7 CDR Field Descriptions and Values

Tag	Variable	Description and Values	Example
a0	VERSIONID	Indicates version ID of the CDR. For internal use only.	N/A
a4	SERVICETYPE	Indicates service type used. For internal use only.	N/A
a6	SOURCEIDENTIFIER	Identifies the Source of the CDR, which can only be the call processor. 16 – call processor	16
a7	SESSIONID	Indicates the session identifier. For internal use only.	N/A
a8	TOTALNUMBERCALLATTEMPTSPERSES	The total number of call attempts made per session.	8
a9	SESSIONSEQUENCENUM	Indicates when a session sequence starts. For internal use only.	N/A

Table 7 CDR Field Descriptions and Values (continued)

Tag	Variable	Description and Values	Example
b0	SESSIONSEQUENCEEND	Indicates when a session sequence ends. For internal use only.	N/A
b1	ACCTAUTHENTICATIONFAILURECNT	Account Auth Failure Count	1
b3	CALLINGPARTYE164ADDRESS	An E.164 number from which the call is placed to the access gateway. Only the phone extension is displayed.	304001
b6	CALLINGPARTYIPADDRESS	Calling Party IP Address	9843771d
b9	CALLEDPARTYE164ADDRESS	An E.164 number of the called destination. Only the phone extension is displayed.	333333
c2	CALLEDPARTYIPADDRESS	Called Party Phone Number	f2794398
d8	INGRESSGATEKEEPERIPADDRESS	Call Processor IP Address	10.10.10.10
e4	CALLIDENTIFIER	This is a globally unique call ID. For internal use only.	N/A
e5	CALLTYPE	Indicates the type of call placed. 1 – Phone to phone 2 – PC to phone 3 – Phone to PC 4 – Fax to fax	1
e6	CALLSTARTTIMEINGRESSGWACCESS	Date and time when the call accessed the ingress gateway.	20050414 19:54:07
e8	CALLSTARTTIMEANSWERED	Date and time when the call is answered. For example, receipt of answer supervision until call disconnect.	20050407 20:37:31
f0	CALLENDTIME	Date and time when the call disconnects. This is typically the time when the billing stops.	20050414 19:54:07
f2	CALLDURATIONCONNECTTODISCONN	Call duration in seconds from connect to disconnect.	2
f3	CODECTYPE	Audio CODEC type used for the call, such as G.729, G.711, or G.723. For internal use only.	N/A

Table 7 CDR Field Descriptions and Values (continued)

Tag	Variable	Description and Values	Example
f4	CALLTERMINATIONCAUSE	Reason for call disconnect or not completed. Note that a value of zero indicates that the call has not been disconnected, or that no disconnect reason was given. Only one value can be provided as the disconnect reason. The codes listed come directly from the all processor and correspond to SIP error codes. You can find a detailed list under SIP RFC 3261.	404
h7	SIGNALINGPROTOCOL	Type of Signaling Protocol For internal use only.	N/A
h8	PROTOCOLTRANSPORT	Type of Protocol Transport For internal use only.	N/A
j5	CALLMODEL	Call Model For internal use only.	N/A
j8	TRANSLATEDCALLEDPARTYE164ADDR	Translated Called Party E.164 address	304001
l1	TEXTCALLIDENTIFIER	SIP Text Call Identifier	80990ea1-8cab-d911-9410-ac771eb4454b
o0	FEATURESUSED	Indicates the feature used during a call. 1 – Speed dial 2 – Call forward unconditional 4 – Call forward ring no answer 8 – Call forward busy 16 – Calling identity suppression	4
o1	URIID	URI ID, which is used for call history.	74000001
o2	CALLEEFORWARDNUMBER	Call Forwarded Number by Called Party.	sip:5555000@10.10.10.10
o4	INBOUNDENDPOINTTYPE	Indicates the type of inbound end point. 2 – Gateway 6 – Terminal 9 – Call processor 10 – Others 11 – Unknown 12 – Redirect call processor 13 – IP Messaging server	6

Table 7 CDR Field Descriptions and Values (continued)

Tag	Variable	Description and Values	Example
o5	OUTBOUNDENDPOINTTYPE	Indicates the type of outbound end point. 2 – Gateway 6 – Terminal 9 – Call processor 10 – Others 11 – Unknown 12 – Redirect call processor 13 – IP Messaging server	2
o6	TRANSFEREDTOURI	URI that a call was transferred to.	74000002
o7	TRANSFERINGPARTYURI	URI of the transferring Transferring Party URI	74000003
o8	REFERENCECALLID	This is the reference text call ID for when silent monitor and barge in is used. Not supported in this release.	N/A
o9	FORWARDINGPARTYURI	Forwarding party URI. Not supported in this release.	N/A
p1	GROUPNAME	The name of a hunt group that was defined when it was created.	1stShift
p2	CALLQUEUEEXITTIME	The call queue exit time in a hunt group - the time stamp filed. Not supported in this release.	N/A
p3	MEMBEREXTENSION	The member extension used in a hunt group.	21113

Viewing CDRs

CDRs are stored on the server hosting the Accounting service. In a multi-site VCX system, the CDRs gathered by multiple Accounting services and stored on multiple servers can be sent to a single Call Records service.

To view a CDR stored on a server hosting the Accounting service:

1. Log on to server hosting the Accounting service as *cworks*.
2. The CDRs are stored in the */opt/3com/VCX/acctxml/db/export* directory.

   The newest CDR is listed last and looks similar to the following:

   ```
   cdr200504111533531_c.xml
   ```

   The file naming convention uses this format:

```
cdr<Year Month Date Hour Minutes ThreeExtraNumbers>_c.xml
```

A CDR looks similar to this:

```
<cdr_collection><cdr><a0>1</a0><a4>2</a4><a6>16</a6><a7></a7
><a8>1</a8><a9>1</a9><b1>1</b1><b3>304010</b3><b6>98437911</
b6><b9>304002</b9><c2>98437f49</c2><e5>1</e5><e6>20050411
20:32:22</e6><e8>20050411 20:32:22</e8><f0>20050411
20:32:43</f0><f2>21</f2><f3>0</f3><h7>1</h7><h8>0</h8><j5>2<
/j5><l1>008fbe79-36a9-d911-89b3-b82da66107be</l1><o0>4</o0><
o1>114000001</o1><o2>sip:8475555000@10.10.10.10</o2><o4>6</o
4><o5>2</o5><j8>8475555000</j8></cdr></cdr_collection>
```

Viewing Super CDRs

Super CDRs are stored on the Call Records service.

To view a Super CDR:

1. Log on to the VCX server hosting the Call Records service as *cworks*.
2. The Super CDRs are kept in the */opt/3com/VCX/bssxml/data/<Group Name>/outbox* directory.

   The newest Super CDR is listed last and looks similar to the following:

   ```
   20050414145513681.xml
   ```

   The file naming convention uses this format:

   ```
   <Year Month Date Hour Minutes ThreeExtraNumbers>.xml
   ```

   A Super CDR looks similar to this:

   ```
   <cdr_collection><cdr><l1>80990ea1-8cab-d911-9410-ac771eb4454
   b</l1><o4>6</o4><o5>11</o5><a0>1</a0><a4>2</a4><a6>16</a6><a
   8>1</a8><a9>1</a9><b3>304001</b3><b6>9843771d</b6><b9>333333
   </b9><e5>1</e5><e6>20050414 19:54:07</e6><f0>20050414
   19:54:07</f0><f2>0</f2><f3>0</f3><f4>404</f4><h7>1</h7><h8>0
   </h8><j5>2</j5><o1>74000001</o1></cdr></cdr_collection>
   ```

QoS Monitoring Statistics

A call processor can also generate Quality of Service (QoS) statistics.

You can enable the collection of QoS statistics on a call processor to objectively monitor voice quality in your VCX system.You can also use QoS statistics to determine the effect of configuration changes and to identify faulty end points or routes.

You can enable collection of QoS statistics and view the collected statistics through the 3Com Enterprise Management Suite (EMS), version 2.3. QoS statistics also generate QDRs (Quality of Service Detail Records)

in XML format and stored on the Accounting server in the */opt/3com/VCX/acctxml/qos* directory. You can use a third-party application to download the QDRs and create reports.

QoS monitoring, as implemented on a VCX system, covers 3Com IP telephones (models 310x) as endpoints. The EMS administrator can:

- Configure one or more monitored endpoints or subnets.
- Configure thresholds for QoS statistics generation by the phones on those monitored subnets.
- Configure alarm thresholds for trap notifications based on QoS parameters.
- View generated statistics using SNMP.

The following QoS statistics can be recorded at the end of every call for each leg of the call. These statistics are recorded in the call history table on the Accounting server, and available through EMS.

- Codec Sample Size
- SIP Call ID
- Codec Type
- Device Type
- Computed Mean Opinion Score
- Jitter
- Packet Loss
- Round Trip Delay
- Call Start Time
- Call End Time
- Caller Extension and IP address
- Called Party extension and IP address

In addition to call statistics, the following aggregate average statistics are available at the endpoint or subnet level, depending on how the statistics collection is configured. These parameters are set to default thresholds, using EMS, on the call processor.

- Computed Mean Opinion Score Average
- Jitter Average

- Packet Loss Average
- Round Trip Delay Average

Note the following QoS monitoring considerations:

- QoS configuration information (for example, monitored endpoints and thresholds) is persistent across system reboots and upgrades.
- The endpoint statistics and call history tables available for viewing through EMS do not persist across reboots of the system, upgrades, or restarts of the Accounting server.
- No QoS data is lost—it is all available in the XML formatted QDRs stored by the Accounting server.

For more information on using QoS monitoring and collecting QoS statistics, refer to the EMS version 2.3 documentation.

3 MANAGING VCX SERVERS

This chapter describes various maintenance tasks you may need to perform on the VCX services running on servers in your VCX system.

Most maintenance tasks require logging in to a VCX server using one of the VCX system accounts. Each account has an associated password. See About VCX Passwords *for more information.*

This chapter includes the following topics:

- Managing the Tomcat Web Server
- Changing a Daylight Saving and Time Zone Configuration
- Managing Log and CDR Files
- Verifying Service Operation
- Managing the Common Agent
- Managing the Call Processor Service
- Managing the Accounting Service and the Authentication and Directory Service
- Managing the SIP Phone Downloader
- Managing the IP Messaging Service
- Managing Authorized SNMP Station Access
- Changing Codecs

Managing the Tomcat Web Server

The Tomcat web server allows administrators and users to access web-based VCX management and provisioning interfaces. The Tomcat server can run on an IP Telephony and IP Messaging Server, an IP Telephony Server, an IP Messaging Server, or a Call Server.

Verifying Tomcat Server Status

To verify that the Tomcat server is running:

1. Log in into the server hosting the Tomcat server using the *root* account.
2. Enter the following command:

   ps -aux | grep tomcat

   If Tomcat is running, the operating system returns output similar to the following:

```
tomcat   11619  0.0  3.7 496564 95892 ?      S    Jun05   5:37
/opt/3com/VCX/j2sdk/bin/java -Xms32m -Xmx256m
-Djava.util.logging.manager=
org.apache.juli.ClassLoaderLogManager -Djava.endorsed.dirs=
/opt/3com/VCX/tomcat/common/endorsed -classpath
:/opt/3com/VCX/tomcat/bin/bootstrap.jar:/opt/3com/VCX/tomcat
/bin/commons-log
root 17471  0.0  0.0  3888  600 pts/0 S 06:57 0:00 grep tomcat
```

Stopping the Tomcat Server

You may need to stop and start the Tomcat web server (for example, when performing a VCX software upgrade).

To stop the Tomcat process:

1. Log in into the server hosting the Tomcat server using the *tomcat* account.
2. Enter the following commands:

   cd /opt/3com/VCX/scripts/rc3.d

   ./S70tomcat stop

   exit

Starting the Tomcat Server

To start the Tomcat process:

1. Log in into the server hosting the Tomcat server using the *tomcat* account.
2. Enter the following commands:

```
cd /opt/3com/VCX/scripts/rc3.d
./S70tomcat start
exit
```

Clearing the Tomcat Cache

If your browser generates page errors while accessing the VCX Central Manager or any of the web-based management interfaces (VCX Administrator, VCX User, or IP Messaging) such as "page not found", "page doesn't render", "page doesn't render correctly", or "exception faults", you may need to clear the Tomcat cache.

To clear the Tomcat cache, enter these commands:

1. Log in into the server hosting the Tomcat server using the *tomcat* account.
2. Enter the following commands:

```
cd /opt/3com/VCX/scripts/rc3.d
./S70tomcat stop
cd /opt/3com/VCX/tomcat/work
rm -rf *
cd /opt/3com/VCX/scripts/rc3.d
./S70tomcat start
```

Changing a Daylight Saving and Time Zone Configuration

If you need to modify the daylight saving and time zone configuration for a VCX system, you should use the **`vcx-config-network`** tool. Although it appears time zone and daylight saving time settings can be modified using the Enterprise Management Suite (EMS), all configurations are not currently supported (you cannot change the original daylight saving configuration status). Also, EMS does not support as many time zone options as the **`vcx-config-network`** tool.

When using the **`vcx-config-network`** tool, both the daylight saving and time zone preferences are configured at the same time.

To modify the daylight saving or timezone configuration for your VCX system:

1. Log in into the server hosting the VCX IP Telephony Server using the *root* account.
2. Enter the following command to start the configuration tool:

```
vcx-config-network
```

3 Enter the following command:

```
setup timezone
```

4 Follow the prompts to change the time zone setting.

5 Enter the following commands:

```
save
exit
```

The configuration tool applies the changes.

Managing Log and CDR Files

VCX software writes data to various log files and call information to Call Detail Records (CDRs) and, optionally, Quality of Service Detail Records (QDRs). IP Messaging software also writes call information to CDRs. As part of your routine VCX server maintenance schedule, you should examine the directories containing these files and purge older files to maintain sufficient disk space.

You should monitor the following applications and services:

- Tomcat and IP Messaging log files
- Accounting service for CDR and QDR collection

Tomcat and IP Messaging Log File Maintenance

Files in the tomcat directory (*/opt/3com/VCX/tomcat/logs/*) you should monitor include:

- catalina.out files, for example, *catalina.2006-07-10.log*
- localhost_access_log files, for example, *localhost_access_log.2006-08-08.txt*

There is currently no mechanism in place to roll over these files or limit file size. You can either move the older versions of these files to another server for storage or delete them.

You should closely monitor the following IP Messaging log file:

- *ums_cbipi.log* located in the */usr/app/cbipi/* directory

  This file grows indefinitely and, if it reaches the operating system limit, can prevent IP Messaging from taking calls. Growth rate depends on the call load on the system. Restarting IP Messaging does not reset the file—you must either move *ums_cbipi.log* to another server for storage or delete the file.

- Additional IP Messaging files you should periodically examine include:
  - */usr/app/gen/app.out*
  - */usr/app/gen/eml_client.out*
  - */usr/app/gen/cpy4.out*

  Each of these files resets after a restart of IP Messaging. Consequently, these files will not grow too large unless the system is extremely busy or the system runs without a restart for a long period of time (months).

CDR File Maintenance

Storage of CDRs is not an issue if your VCX system includes a dedicated server running the Call Records service. In this case, the Call Records service off loads CDRs from each configured Accounting service (see Call Records Service Overview). If, however, your VCX system does not include a Call Records service, CDRs continually accumulate on each server running the Accounting service.

If your VCX system does not include a Call Records service, you can configure the Accounting service to be self-cleaning by editing the Accounting service configuration file or modifying the appropriate SNMP MIB variables.

To modify the Accounting service configuration file:

1. Log in to the server running the Accounting service using the *root* account.
2. Enter the following command:

   `cd /opt/3com/VCX/acctxml/conf/`
3. Use an editor to open the following file:

   `acctxmlconfig.xml`
4. In the `<CONFIGURATION_INFO>` section, locate the `<BES_CDRFILE_CONFIG>` subsection and find the following variables:

   ```
   AUTO_CLEAN_IF_NO_LATEST_UPDATE="N"
   AUTO_CLEAN_IF_NO_LATEST_UPDATE_INTERVAL="96"
   ```

   The first variable determines whether or not CDRs are purged if the Accounting service has not received notification from the Call Records service within the time period (96 hours) specified by the second variable.

   By default, the variable `AUTO_CLEAN_IF_NO_LATEST_UPDATE` is set to N. If you have Call Records service configured to collect CDRs from the

Accounting server, do not change this setting. The Call Records service will purge CDRs from the Accounting server after collecting them.

If you do not have Call Records service, change this setting to `AUTO_CLEAN_IF_NO_LATEST_UPDATE="Y"` to enable self-cleaning on the Accounting service.

The variable `AUTO_CLEAN_IF_NO_LATEST_UPDATE_INTERVAL` is set to 96 hours (four days) by default. A smaller value initiates the self-cleaning more often. A larger value allows the CDRs to remain on the Accounting server longer.

5 Save your changes.

You can also configure the Accounting service to be self-cleaning by modifying the *itbes_xml_cdr.mib* variables:

- `itbesCdrAutoCleanIfLatestStale`
- `itbesCdrAutoCleanIfLatestStalePeriod`

QDR File Maintenance

Management of QDRs storage is similar to CDR management except that QDR generation is disabled by default (see QoS Monitoring Statistics) and QDRs are not collected by the Call Records service. You can, however, configure the Accounting service to be self-cleaning by editing the Accounting service configuration file or modifying the appropriate SNMP MIB variables.

To modify the Accounting service configuration file:

1 Log in to the server running the Accounting service using the *root* account.

2 Enter the following command:

```
cd /opt/3com/VCX/acctxml/conf/
```

3 Use an editor to open the following file:

```
acctxmlconfig.xml
```

4 In the `<CONFIGURATION_INFO>` section, locate the `<BES_QOSFILE_CONFIG>` subsection and find the following variables:

```
AUTO_CLEAN_IF_NO_LATEST_UPDATE="N"
AUTO_CLEAN_IF_NO_LATEST_UPDATE_INTERVAL="96"
```

The first variable determines whether or not QDRs are purged.

By default, the variable `AUTO_CLEAN_IF_NO_LATEST_UPDATE` is set to N.

If you enable generation of QoS statistics and QDRs, change this setting to `AUTO_CLEAN_IF_NO_LATEST_UPDATE="Y"` to enable self-cleaning on the Accounting service.

The variable `AUTO_CLEAN_IF_NO_LATEST_UPDATE_INTERVAL` is set to 96 hours (four days) by default. A smaller value initiates the self-cleaning more often. A larger value allows the QDRs to remain on the Accounting server longer.

5 Save your changes.

You can also configure the Accounting service to be self-cleaning by modifying the *vcx-qos-performance-monitor-xml-mib.mib* variables:

- `vcxQoSPerformanceMonitorXmlAutoCleanIfLatestStale`
- `vcxQoSPerformanceMonitorXmlAutoCleanIfLatestStalePeriod`

Verifying Service Operation

To determine if the Accounting Service, Authentication and Directory Service, Common Agent, IP Messaging system, or the Call Processor associated monitor process is running, log in to the appropriate server as *root* and enter:

```
ps -A | grep cw
```

In the list that appears, verify that these process names are displayed:

- **cw_acctxml** — Accounting Service
- **cw_vcxdata** — Authentication and Directory Service
- **cw_cagent** — Common Agent
- **cw_ipums** — IP Messaging System
- **cw_procmon** — Monitor process associated with the Call Processor

Use the procedures outlined in the next sections to start or stop one of these processes.

Managing the Common Agent

The Enterprise Management Suite (EMS) connects to the Accounting Service, Authentication and Directory Service, the Call Records Service, the IP Messaging Service, or the Call Processor Service using the Common Agent, which is installed by default on all VCX servers. The Common Agent is normally running but can be stopped and started using the console terminal or a Secure Shell (SSH) remote login connection.

Starting the Common Agent

To start the Common Agent:

1. Log in using the *root* account.
2. Enter the following commands:

```
cd /opt/3com/VCX/commagent/vcx-scripts/init.d
./commagent start
```

Stopping the Common Agent

you can stop the Common Agent using operating system commands or using EMS.

The Accounting Service (acctxml), Authentication and Directory Service (vcxdata), Call Records Service (bssxml), and the Call Processing Server (callp) cannot be viewed from EMS when the Common Agent is stopped.

Using Operating System Commands

To stop the Common Agent using operating system commands:

1. Log in to the server running the Common Agent you want to stop using the *root* account.
2. Enter the following commands:

```
cd /opt/3com/VCX/commagent/vcx-scripts/init.d
./commagent stop
```

Using EMS

Use EMS to stop the Common Agent immediately or gracefully.

To stop the Common Agent *immediately*:

1. From the Explorer tab, right-click **3Com SNMP Agent**.
2. From the pop-up menu, select **Maintenance**, then select **Hard Shutdown**.

To stop the Common Agent *gracefully*:

1. From the Explorer tab, right-click **3Com SNMP Agent**.
2. From the pop-up menu, select **Maintenance**, then select **Graceful Shutdown**.

   A dialog box displays the progress of the command. When the Common Agent has been restarted, the Working icon changes to a Finished icon.
3. Click **Close**.

Restarting the Common Agent

If the Common Agent is currently running, use EMS to restart the Common Agent immediately or gracefully. If the Common Agent is stopped, EMS will not be able to communicate with the VCX system to issue the restart command. The Common Agent can also be restarted from the VCX console.

Using Operating System Commands

If the Common Agent has been stopped, you can start it using operating system commands:

1. Log in to the server running the Common Agent you want to restart using the *root* account.
2. Enter the following commands:

```
cd /opt/3com/VCX/commagent/vcx-scripts/init.d
./commagent start
```

The **`commagent`** script does not accept **`restart`** or **`status`** as a valid arguments.

Using EMS

You can use EMS to restart the Common Agent immediately or gracefully.

To restart the Common Agent *immediately*:

1. From the Explorer tab, right-click **3Com SNMP Agent**.
2. From the pop-up menu, select **Maintenance**, then select **Hard Shutdown**.

To restart the Common Agent *gracefully*:

1. From the Explorer tab, right-click 3Com SNMP Agent.
2. From the pop-up menu, select **Maintenance**, then select **Graceful Shutdown**.

   A dialog box displays the progress of the command. When the Common Agent has been restarted, the Working icon changes to a Finished icon.
3. Click **Close.**

Managing the Call Processor Service

This section describes how to start and stop the Call Processor service, and how to view Call Processor service status.

The script that starts the Call Processor service runs the Call Processor service in the background with the Call Processor process monitor. The process monitor monitors the Call Processor server application and restarts it if the application stops.

Once the Call Processor service is started, it is automatically restarted by the process monitor if there is a failure, and it is automatically restarted if the VCX server is rebooted. The Call Processor service does not need to be started again unless one of the following exceptions occurs:

- You stop the Call Processor service using the script with the **`stop`** option
- The process monitor exceeds the set number of automatic restarts

Verifying the Call Processor Status

To verify that the Call Processor service is running:

1. Log in into the server hosting the Call Processor service using the *root* account.
2. Enter the following command:

   ```
   ps -ef | grep call
   ```

   - The Call Processor service is running if the Call Processor Process ID is listed.
   - The Call Processor service is not running if only the root ID is listed.

Starting the Call Processor

To start the Call Processor service:

1. Log in into the server hosting the Call Processor service using the *root* account.
2. Enter the following commands:

   ```
   cd /opt/3com/VCX/scripts/rc3.d
   ./S80callp start
   ```

Stopping the Call Processor

You can stop the Call Processor service using operating system commands or by using EMS.

Using Operating System Commands

To stop the Call Processor service using operating system commands:

1. Log in into the server hosting the Call Processor service using the *vcx* account.
2. Enter these commands:

```
cd /opt/3com/VCX/scripts/rc3.d
./S80callp stop
```

Using EMS

To stop the Call Processor service from EMS:

1. From the Explorer tab, right-click the **3Com Call Processor** service.
2. From the pop-up menu, select **Maintenance**, then select **Hard Shutdown**.

A dialog box appears and displays the progress of the command. When the command has been completed, the Working icon changes to a Finished icon.

Restarting the Call Processor

You can restart the Call Processor service using operating system commands or using EMS. Restarting the Call Processor service stops and restarts the Call Processor service but leaves the Call Processor monitor running.

Using Operating System Commands

To restart the Call Processor service using operating system commands:

1. Log in into the server hosting the Call Processor service using the *vcx* account.
2. Enter these commands:

```
cd /opt/3com/VCX/scripts/rc3.d
./S80callp restart
```

Using EMS

To restart the Call Processor service from EMS:

1. From the Explorer tab, right-click the **3Com Call Processor** service.
2. From the pop-up menu, select **Maintenance**, then select **Hard Restart** to shutdown and restart the Call Processor service.

Managing the Accounting Service and the Authentication and Directory Service

This section describes maintenance tasks for the following VCX services (sometimes referred to as back-end servers):

- Accounting service
- Authentication and Directory service

The location of each service depends on your VCX configuration.

- The Accounting service always runs on the server hosting the IP Telephony server.
- The Authentication and Directory service can run on either the IP Telephony server or, in some multi-site configurations, on the Authentication and Directory server.

To determine where (the IP address) a service is running, enter the following command (logged in as *root*) on the server hosting the primary call processor:

```
vcx-config-services --show
```

This command returns a multi-page display that shows your VCX system configuration, including lines similar to the following:

```
---------Displaying Accounting Service ---------

Local IP Address : 10.230.63.6
```

For information on configuring Accounting Service groups, see Chapter 2.

For information on Authentication and Directory service database maintenance, see Chapter 5.

Viewing Service Status

To view the status of the Accounting service or the Authentication and Directory service:

1. Log in to the server hosting the service whose status you want to view using the *root* account.
2. Enter the following commands:

   ```
   cd /opt/3com/VCX/scripts/rc3.d
   ./<back-end server> status
   ```

   For ***<back-end server>***, enter one of the following identifiers:

   - For an Accounting service enter **`S40acctxml`**
   - For an Authentication and Directory service enter **`S20vcxdata`**

Starting a Service

To start the Accounting service or the Authentication and Directory service:

1. Log in to the server hosting the service you want to start using the *root* account.
2. Enter the following commands:

   ```
   cd /opt/3com/VCX/scripts/rc3.d
   ./<back-end server> start
   ```

   For ***<back-end server>***, enter one of the following identifiers:

   - For an Accounting service enter **`S40acctxml`**
   - For an Authentication and Directory service enter **`S20vcxdata`**

Stopping a Service

To stop the Accounting service or the Authentication and Directory service:

1. Log in to the server hosting the service you want to stop using the *root* account.
2. Enter the following commands:

   ```
   cd /opt/3com/VCX/scripts/rc3.d
   ./<back-end server> stop
   ```

   For ***<back-end server>***, enter one of the following identifiers:

   - For an Accounting service enter **`S40acctxml`**
   - For an Authentication and Directory service enter **`S20vcxdata`**

Restarting a Service

To restart the Accounting service or the Authentication and Directory service:

1. Log in to the server hosting the service you want to restart using the *root* account.
2. Enter the following commands:

   `cd /opt/3com/VCX/scripts/rc3.d`

   `./<back-end server> restart`

   For **`<back-end server>`**, enter one of the following identifiers:

   - For an Accounting service enter **`S40acctxml`**
   - For an Authentication and Directory service enter **`S20vcxdata`**

Enabling Message Tracing

The files *acctxmlconfig.xml* (Accounting service) and *vcxdataconfig.xml* (Authentication and Directory service) each have a setting to enable message tracing through formatted Abstract Symbolic Notation (ASN.1). This produces an understandable output that can be used for trouble locating and clearing.

ASN.1 is a message formatting and encoding standard which is the basis of the 3Queue protocol used between Tier 2 and Tier 3.

To enable message tracing:

1. Log in to the server hosting the service using the *root* account.
2. Stop the service (see Stopping a Service).
3. Enter the following command to change directories:

   `cd /opt/3com/VCX/<schema>/conf`

   For **`<schema>`**, enter **`acctxml`** for the Accounting service or enter **`vcxdata`** for the Authentication and Directory service.

4. Edit the *acctxmlconfig.xml* file or the *vcxdataconfig.xml* file, and enable *Formatted ASN Packet Tracing.*

   Example:

   ```
   <!-- Formatted ASN packet Tracing-->^M
   <!-- 0 = OFF, 1 = ON -->^M
   <ASNTRACE VALUE = "1"/>
   ```

5. Start the service (see Starting a Service).

   The logs are written to the directory that the back-end server is run from:

   `/opt/3com/VCX/<schema>/log`

Enabling Server Logging

The files *acctxmlconfig.xml* (Accounting service) and *vcxdataconfig.xml* (Authentication and Directory service) each have a setting to enable server logging. This is used to control the common logging function, which is shared with all Tier 2 and Tier 3 devices. This controls the logging of various status, warning, and error messages in the server. For normal operation, the default settings might be sufficient, but for trouble locating purposes, the various error, warning, informational, and tracing log levels can also be used.

To enable message tracing:

1. Log in to the server hosting the service using the *root* account.
2. Stop the service (see Stopping a Service).
3. Enter the following command to change directories:

   `cd /opt/3com/VCX/<schema>/conf`

   For **`<schema>`**, enter **`acctxml`** for the Accounting service or enter **`vcxdata`** for the Authentication and Directory service.
4. Edit the *acctxmlconfig.xml* file or the *vcxdataconfig.xml* file, and enable server logging.

   Example:

   ```
   <BES_COMMONLOGG_CONFIG>
   <!-- Set Y or N to enable or Disable -->
   <LOG_INFO LOG_FILE_PATH ="../log/" LOG_FILE_NAME="AuthServer"
   LOG_TO_CONSOLE="Y" LOG_TO_FILE="Y" LOG_TO_SYSTEM = "Y"
   LOG_TRACE_ON ="Y" LOG_INFO_ON ="Y" LOG_WARN_ON = "Y"
   LOG_ERROR_ON = "Y" LOG_SYSTEM_ON="Y" LOG_TIME_INTERVAL="4"
   LOG_TIMESTAT_ON="Y" NUMBER_OF_MSG="1000"/>
   ```
5. Start the service (see Starting a Service).

   The logs are written to the directory that the service is run from:
   `/opt/3com/VCX/<schema>/log`

SNMP Support

The SNMP Common Agent, enabled by default, allows back-end server recognition by SNMP MIB browsers such as Enterprise Management Suite (EMS). If you suspect the SNMP Common Agent is not enabled, see the following section, Verifying SNMP Support.

Verifying SNMP Support

To verify that either the *acctxmlconfig.xml* (Accounting service) or *vcxdataconfig.xml* (Authentication and Directory service) files are set up for the back-end server:

1. Log in to the server hosting the service using the *root* account.
2. Enter the following command:

   `cd /opt/3com/VCX/<schema>/conf`

   For **`<schema>`**, enter **`acctxml`** for the Accounting service or enter **`vcxdata`** for the Authentication and Directory service.
3. Open the *acctxmlconfig.xml* file or the *vcxdataconfig.xml* file.
4. Find the *SNMP Configuration* tag, verify that the *SNMP Common Agent* is enabled.

   It should look like this:

   ```
   <!-- Enable or Disable SNMP Common Agent-->^M
   <!-- Interface, 0 = OFF, 1 = ON  -->^M
   <ENABLED VALUE = "1"/>
   ```
5. If SNMP support is disabled, continue with Enabling SNMP Support.

Enabling SNMP Support

To enable SNMP support:

1. Log in to the server hosting the service using the *root* account.
2. Stop the Common Agent service by entering the following commands:

   `cd /opt/3com/VCX/commagent/vcx-scripts/init.d`
   `./commagent stop`
3. Stop the service on which you want to enable SNMP support (see Stopping a Service).
4. Enter the following command to change directories:

   `cd /opt/3com/VCX/<schema>/conf`

   For **`<schema>`**, enter **`acctxml`** for the Accounting service or enter **`vcxdata`** for the Authentication and Directory service.
5. Edit the *acctxmlconfig.xml* file or the *vcxdataconfig.xml* file.

   Example:

   ```
   <!-- Enable or Disable SNMP Common Agent-->^M
   <!-- Interface, 0 = OFF, 1 = ON  -->^M
   <ENABLED VALUE = "1"/>
   ```

6 Start the Common Agent service by entering the following commands:

```
cd /opt/3com/VCX/commagent/vcx-scripts/init.d
./commagent start
```

7 Start the service (see Starting a Service).

Managing the SIP Phone Downloader

The SIP Phone Downloader loads an application image on to a 3Com phone, which enables SIP support on the phone.

Starting the SIP Phone Downloader

To start the SIP Phone Downloader:

1 Log in to the server hosting the SIP phone downloader using the *root* or *vcx* account.

2 Enter the following commands:

```
cd /opt/3com/VCX/devdnldsvr/vcx-scripts/init.d
./S90devdnldsvr start
```

Stopping the SIP Phone Downloader

To stop the SIP phone downloader application:

1 Log in to the server hosting the SIP phone downloader using the *root* or *vcx* account.

2 Enter the following commands:

```
cd /opt/3com/VCX/devdnldsvr/vcx-scripts/init.d
./S90devdnldsvr stop
```

Restarting the SIP Phone Downloader

To restart the SIP phone downloader application:

1 Log in to the server hosting the SIP phone downloader using the *root* or *vcx* account.

2 Enter the following commands:

```
cd /opt/3com/VCX/devdnldsvr/vcx-scripts/init.d
./S90devdnldsvr restart
```

Managing the IP Messaging Service

The IP Messaging service provides voicemail and unified messaging services to users.

Verifying IP Messaging Service Status

To verify the status of the IP Messaging service:

1. Log in to the server hosting the IP Messaging service using the *app* account.
2. Enter the following commands:

```
cd /opt/3com/VCX/scripts/rc3.d
./S60ums status
```

Starting the IP Messaging Service

To start the IP Messaging service:

1. Log in to the server hosting the IP Messaging service using the *app* account.
2. Enter the following commands:

```
cd /opt/3com/VCX/scripts/rc3.d
./S60ums start
```

Stopping the IP Messaging Service

To stop the IP Messaging service:

1. Log in to the server hosting the IP Messaging service using the *app* account.
2. Enter the following commands:

```
cd opt/3com/VCX/scripts/rc3.d
./S60ums stop
```

Restarting the IP Messaging Service

To restart the IP Messaging service:

1. Log in to the server hosting the IP Messaging service using the *app* account.
2. Enter the following commands:

```
cd /opt/3com/VCX/scripts/rc3.d
./S60ums restart
```

Managing Authorized SNMP Station Access

You can use an SNMP management station, such as 3Com Corporation's Enterprise Management Suite, to manage a VCX server. You must, however, grant the management station explicit access to the VCX server to enable the exchange of SNMP management and monitoring messages.

You can add and delete SNMP stations using the `cagManageAuthorizedStations` script.

Note the following considerations:

- The `vcx-reconfigure` script provides the option to enable or disable management station authentication. Enabling management station authentication allows you to specify up to four stations using `vcx-reconfigure`.
- Authorized stations added through `cagManageAuthorizedStations` or through EMS must be deleted through `cagManageAuthorizedStations` or through EMS. You cannot selectively remove one of these stations while running `vcx-reconfigure` (refer to the *VCX Installation Guide* for information to `vcx-reconfigure`). Authorized stations added through `cagManageAuthorizedStations` or EMS are not visible from `vcx-reconfigure`.
- If you disable management station authentication while running `vcx-reconfigure`, *all* previously configured authorized stations are removed.

To allow an SNMP management station access to a VCX server:

1. Log on the VCX server you want to manage using the *root* account.
2. Enter the following command to change directories:

   `cd /opt/3com/VCX/bin`

3. Enter the following command to start the manage authorized stations script:

   `./cagManageAuthorizedStations`

   The script displays the following menu:

```
************Manage Authorized Stations Menu**********
*************************************************
show :- Display existing authorized stations configuration
add :- Add a new authorized station
```

```
delete :- Remove an authorized station entry
quit:- exit this utility
help:- show commands that are supported
**************************************************
supported commands are "show", "add", "delete", "quit",
"help"::
```

- To add an SNMP management station, enter **add**. The script prompts you to enter the IP address and network mask of the management station you want to add.
- To delete an existing SNMP management station, enter **delete**. The script prompts you to enter the IP address and network mask of the management station you want to delete.
- To display a list of the SNMP stations currently allowed access to this server, enter **show**.

Changing Codecs

Before voice traffic can be transmitted over a digital network, the audio waveform, an analog signal, must be encoded into a digital format. The digitized audio is packetized and delivered over the network to a destination, and then decoded back into a voice waveform. Software called a codec (coder/decoder) converts the audio information between digital and analog formats.

Digitized audio formats have different properties. Each format represents a compromise between bandwidth and audio quality, that is, high quality audio typically requires more network bandwidth. Compressing the digitized audio data can conserve bandwidth with little compromise in audio quality, but compression requires increased processing overhead when encoding and decoding the audio information. Too much processing overhead can introduce delay.

IP Messaging can operate with either the G.711u codec or the G.729a codec.

Each codec includes a set of language prompts. By default, IP Messaging operates with the G.711u codec and US English language prompts.

Each set of language prompts, available with the G.711u codec or the G.729a codec, is constructed as RPM Package Manager package. For example, IP Messaging provides the following two RPMs for UK English:

- IPMSG-UK-EN-G711u-SPEAK-1-1.i386.rpm
- IPMSG-UK-EN-G729a-SPEAK-1-1.i386.rpm

If you want to enable a set of language prompts that are compatible with the currently operating codec, simply run the add_language utility as described in "Adding a Set of Language Prompts" in the *IP Messaging Module Operations and System Administration Guide*.

IP Messaging supports only one codec at a time.

- If you want your IP Messaging system to operate with a different codec (for example, switch from the default G.711u codec to the G729a codec), you must run the change_codec utility, as described in How to Change Your Codec.
- If you want to convert custom recorded prompts and saved voice mail from on codec to another, you must run the codec_data_convert utility, as described in Converting Prompts and Messages to a Different Codec.

How to Change Your Codec

When you change the codec used on an IP Messaging system, you must make the change on both the primary IP Messaging server and the secondary IP Messaging server.

CAUTION: *If you configure an existing IP Messaging system to use a different codec, all custom prompts and voice mail messages saved in the previous codec format will be lost. To avoid this loss, run the codec_data_convert utility before running the change_codec utility. See* Converting Prompts and Messages to a Different Codec.

The following example assumes the IP Messaging system is operating with the default codec (G.711u) and the default set of language prompts (US English). The steps in the example install the G.729a codec and enable UK English language prompts.

1. Log in to the primary IP Messaging server using the *root* account.
2. Enter the following command to switch to the IP Messaging installation directory:

   ```
   cd /opt/installtemp
   ```

   Note that if you have upgraded your IP Messaging system, new files are located in **`/opt/installtemp/upgrade_7.1.yc`**.
3. Enter the following command to install the G.729a codec:

   ```
   vcx-install IPMSG-UK-EN-G729a-SPEAK-1-1.i386.rpm
   ```

4 Enter the following command to switch to the directory containing the add_language and change_codec: utilities:

```
cd /usr/app/app.dir
```

5 Enter the following command to run the add_language utility:

```
./add_language
```

6 Enter the appropriate response to the prompt to add UK English language prompts.

7 Enter the following command to run the change_codec utility:

```
./change_codec g729a
```

8 Stop and restart IP Messaging by entering the following commands:

```
cd /opt/3com/VCX/UMS/vcx-scripts/init.d
```

```
./S60ums stop
./S60ums start
```

9 Log in to the secondary IP Messaging server and repeat steps 2 through 8.

Note that steps 5 and 6 may be optional. If, in the example, you were changing to the G.729a codec with US English language prompts, steps 5 and 6 would be unnecessary because the US English prompts are already enabled.

Converting Prompts and Messages to a Different Codec

IP Messaging supports only one codec at a time and operates with the G.711a codec by default.

If you want to switch to a different codec (for example, switch from the default codec to the G729a codec), you can run the change_codec utility. However, if you run the change_codec utility on an IP Messaging system on which custom prompts have been recorded and voice mail messages have been saved in the previous codec format, those prompts and messages will be lost. To preserve existing custom prompts and voice mail messages, run the codec_data_convert utility before running the change_codec utility.

When you convert custom prompts and voice mail messages to a different codec, you should run the codec_data_convert utility on both the primary IP Messaging server and the secondary IP Messaging server.

The following example assumes the IP Messaging system is operating with the default codec (G.711u) and the default set of language prompts

(US English). The steps in the example install the G.729a codec and convert any existing custom prompts and voice mail messages to the G.729a codec format.

IP Messaging must not be actively processing calls while the codec_data_convert utility is running.

1. Log in to the primary IP Messaging server using the *root* account.
2. Enter the following command to switch to the IP Messaging installation directory:

   ```
   cd /opt/installtemp
   ```

3. Enter the following command to install the G.729a codec:

   ```
   vcx-install UMS-UK-EN-G729a-SPEAK-1-1.i386.rpm
   ```

4. Enter the following command to switch to the directory containing the codec_data_convert utility:

   ```
   cd /usr/app/app.dir
   ```

5. Enter the following command to run the codec_data_convert utility:

   ```
   ./codec_data_convert g711u g729a
   ```

   If the utility runs successfully, it returns a list of converted files and the total number of files processed. If the utility fails to run successfully, it returns an error message and stops further processing.

6. Log in to the secondary IP Messaging server and repeat steps 2 through 5.

4 BACKING UP AND RESTORING A VCX CONFIGURATION

This chapter describes how to back up and restore a VCX system configuration using the `vcx-config-backup` and `vcx-config-restore` commands. This chapter includes the following topics:

- VCX Configuration Backup and Restore Overview
- Backing Up a VCX Configuration
- Restoring a VCX Configuration
- Backup and Restore Operation Logs

VCX Configuration Backup and Restore Overview

The VCX configuration backup and restore feature allows you to completely back up all relevant VCX configuration data on a machine running one or more VCX services into a single file, and subsequently restore that configuration using the backup file. You can perform the backup and restore operations either locally (using the `vcx-config-backup` and `vcx-config-restore` commands) or remotely (using EMS). This chapter describes the command line option; refer to the EMS documentation for the EMS option.

As described in Chapter 1, a VCX system can include multiple servers running the VCX operating system, VCX Services (such as IP Messaging and the Call Processor), and configuration databases. VCX servers can be installed in different physical configurations according to the features required and the number of subscribers that must be supported.

Because of this distributed nature of a VCX system, there is no centralized source for configuration data. Therefore, to completely back up an entire VCX system, you must perform a configuration backup operation on each machine in your VCX system.

3Com Corporation recommends that you back up configuration files on your VCX system once a week. However, you should back up a configuration whenever you make changes. A restored system will not include configuration changes made after the last backup was performed.

VCX Configuration Backup File Contents

The backup file created by the `vcx-config-backup` command includes the following configuration data:

- **VCX components** — All files containing configuration information for each VCX component are saved, including directory structures.
- **Common configuration files** — Configuration files common to multiple VCX components, such as *VCXConfiguration.xml* and *VSBOM.xml* files, as well as state files and any other configuration data created by the VCX infrastructure, are saved to the backup file.
- **Operating system files** — All VCX operating system files that contain configuration information (that could be modified by the user) or that provide system-unique information are backed up. This typically includes data such as account and password information, networking configuration files, time zone information, SSH host keys, and SSL certificate(s).

Note that the `vcx-config-restore` command includes a parameter, `exclude-os`, that excludes the operating system information from a restore operation. If you select this option, the restore operation generates a warning if the system's current IP configuration does not match the configuration contained in the backup file. An IP mismatch will very likely result in some or all applications not working properly because IP information is also stored within component configuration files.

- **License keys** — The configuration backup file includes the active VCX license key file.

  A restore operation reinstalls the license key file *if* the system's machine identifier matches the machine identifier in the backup file. If the machine identifiers do *not* match, the restore operation will not attempt to reinstall the license key and will generate a warning if no current license key is found. This case typically occurs if the backup file is restored to different hardware as part of a recovery operation, in which case a new license key will be required.

CAUTION: *VCX configuration backup files may contain sensitive information and should be stored in a manner that ensures access only by authorized individuals.*

Backup and Restore Considerations

Note the following considerations when backing up and restoring a VCX configuration:

- Database content (provisioning and voicemail databases) is not considered part of the VCX configuration and is not included in a backup file. To completely backup your VCX system, you should backup database content as well as VCX configuration data.
  - See Chapter 5 for information on backing up the provisioning data stored in the VCX Authentication and Directory server database.
  - See the *IP Messaging Operations and System Administration Guide* for information on backing up voicemail and other IP Messaging data.

  When restoring a system, restore the VCX configuration backup first, then restore the database and IP Messaging backups.
- You cannot back up configuration data from one version of VCX and restore that data to a different version of VCX. That is, you cannot back up a VCX configuration, upgrade VCX software, and then try to

apply the old configuration by restoring the backup file to the upgraded system.

- You can backup and restore the *currently* active version of VCX software and the *currently* active version of the VCX operating system only. Configuration files from any other versions of VCX (or its constituent components) or the operating system which may be on the system are *not* backed up. This means that, depending on the reason for the backup and restore, you may not be able to downgrade a restored system to a prior release.
- You cannot modify a configuration backup file and restore it, either as a way of changing a configuration or as a way of configuring multiple systems with similar configurations.
- Partial backups are not supported (for example, you cannot back up one component or a subset of components) on a single machine.
- Backup files are *not* encrypted. Backup files typically contain sensitive information, and must be treated with care and stored securely.
- Files that do not contain configuration data (for example, log files and cache files) are not backed up.
- Configuration files associated with the VCX operating system that are not typically modified in the course of normal system configuration are not backed up.

Backing Up a VCX Configuration

This section describes how to use the `vcx-config-backup` command to create a VCX configuration backup file.

To create a VCX configuration backup file:

1. Log in, using the *root* account, to the machine hosting the VCX configuration you want to back up.
2. Enter the following command:

   `vcx-config-backup [optional-arguments]`

   The optional arguments include:

   - **`--help`** — Displays information on command usage.
   - **`--fullauto`** — Specifies that the command should run in automatic mode. In this mode, command execution does not provide any interactive prompts or queries.

- **`--test`** — Lists the files that would be backed up but does not create the backup file.

The backup file is created in the */opt/3com/VCX/backup* directory. The directory will be created if it does not already exist.

Note that a VCX component may designate some configuration files and directories as optional. Optional files and directories are backed up if present but no error results if they are absent. Files and directories *not* designated as optional do generate an error if they are not found at the time of backup. The presence of optional files and directories has implications for the restore operation. See Restoring a VCX Configuration.

About the Backup File

This section describes the filename, format, location, and contents of the VCX configuration backup file.

When you run the `vcx-config-backup` command, VCX software creates a backup file in gzipped tar format. The individual files, which represent the complete configuration, are contained within this archive file.

Each backup file uses the following filename format:

```
<hostname>_<systemversion>_<cfgtype>_<timestamp>.tar.gz
```

Table 8 describes each element of the filename format.

Table 8 VCX Configuration Backup File Naming Format

Filename Element	Description
`<hostname>`	Specifies the host name of system on which the `vcx-config-backup` command was executed.
`<systemversion>`	Specifies the active version of VCX software contained in the backup file.

Table 8 VCX Configuration Backup File Naming Format (continued)

Filename Element	Description
`<cfgtype>`	Specifies the configuration *type* of the system on which the vcx-config-backup command was executed. Possible values for type include: ■ **all** — Indicates the host system is running as an IP Telephony and IP Messaging Server. ■ **softswitch** — Indicates the host system is running as an IP Telephony Server. ■ **ums** — Indicates the host system is running as an IP Messaging Server. ■ **callserver** — Indicates the host system is running as a Call Server. ■ **dataserver** — Indicates the host system is running as an Authentication and Directory Server. ■ **bss** — Indicates the host system is running as a Call Records Server. ■ **adhoc** — Indicates the host system is running as a dedicated adhoc Conference Server.
`<timestamp>`	Specifies when the backup file was created using the format YYMMDDHHmm.

For example, a backup file created on 28 April 2006 on a VCX IP Telephony and IP Messaging server named reg2a7 running version 7.1.1 would have the following filename:

```
reg2a7_VCX.7_1_1_all_060428104340.tar.gz
```

Examining a Backup File

You can use the `vcx-backup-query` command to view information about a backup file, for example, the version of VCX on which the archived file is based, the backup date, and backed up components.

To view the contents of a VCX configuration backup file:

1. Log in, using the *root* account, to the machine hosting the VCX configuration backup file you want to back view.
2. Enter the following commands:

```
cd /opt/3com/VCX/backup
vcx-backup-query [optional-arguments] <backup-filename>
```

The optional arguments include:

- **`--help`** — Displays information on command usage.
- **`--fullauto`** — Displays complete information about the backup file (version, operating system version, components, and so on).
- **`--version`** — Displays the version of VCX software for the components contained in the backup file.
- **`--osversion`** — Displays the version of the VCX operating system contained in the backup file.
- **`--components`** — Lists the name of each component, and VCX version for each component, contained in the backup file.
- **`--date`** — Displays the date and time the backup file was created.
- **`--files`** — Lists the configuration files and directories contained in the backup file.
- **`--network`** — Displays the VCX operating system network configuration contained in the backup file.
- **`--machineid`** — Displays the machine id of the backed up system contained in the backup file.

For ***`<backup-filename>`***, enter the name of the backup file you want to examine. See About the Backup File for a description of backup filenames.

Restoring a VCX Configuration

This section describes how to use the `vcx-config-restore` command to restore a VCX configuration backup file.

When you run the `vcx-config-restore` command, by default, the restore operation first creates a new backup of the VCX system's current state. This provides a fallback if the restore operation fails. In this case, the system generates a message indicating the new backup has been created but the system does *not* attempt to restore the new backup. The new backup is created in the */opt/3com/VCX/backup/prerestore* directory:

You can prevent the restore operation from creating the new backup by using the `vcx-config-restore` command with the `--nobackup` option.

The restore operation replaces the existing configuration with the configuration data in the backup file. This means the restore operation may also *remove* existing configuration data. As noted in Backing Up a

VCX Configuration, some configuration files and directories may be designated as optional. Optional files and directories are backed up if present when the `vcx-config-backup` command is executed. Optional files configured *after* the backup operation are removed during the restore operation. Similarly, the content of a directory backup replaces in full the content of the directory at the time of the restore. This may include the removal of any extra files which were added since the backup was created. To avoid losing configuration data, perform a backup operation whenever you change or add to a VCX system configuration.

To restore a VCX configuration backup file:

1. Log in, using the *root* account, to the machine hosting the VCX configuration you want to restore.
2. Enter the following command:

   `vcx-config-restore [optional-arguments] <backup-filename>`

   If you do not specify a path for the **`<backup-filename>`**, the command looks for the backup file in the current location and then in the */opt/3com/VCX/backup* directory.

   The optional arguments include:

   - **`--help`** — Displays information on command usage.
   - **`--fullauto`** — Specifies that the command should run in automatic mode. In this mode, command execution does not provide any interactive prompts or queries.
   - **`--exclude-os`** — Restores all VCX configuration files except the VCX operating system configuration files.
   - **`--nobackup`** — Specifies that command execution will not create a backup of the current VCX configuration before restoring the specified backup file.

   For **`<backup-filename>`**, enter the name of the backup file you want to restore. See About the Backup File for a description of backup filenames.

   When the restore operation completes, all backed-up configuration files are restored to their proper locations.

   During a typical restore operation, command output indicates VCX services are being stopped. Services will not restart automatically when the restore completes because additional steps for example, database restoration) are required.

Note that, for security reasons the VCX firewall is not stopped. Furthermore, the Common Agent stops only briefly while its own restore is done. For EMS-based operations, this minimizes the time during which remote manageability is unavailable.

Backup and Restore Operation Logs

Each execution of the `vcx-config-backup` and `vcx-config-restore` command is tracked using syslog. Information about each backup and restore operation is written to */var/log/messages*.

Logged messages for each operation include information such as the type of operation (backup or restore), the name of the backup file, the success or failure of the operation, and, if the operation failed, a reason for the failure.

You can use the following command to display the last ten lines in the messages file:

```
tail -f /var/log/messages
```

The **`-f`** argument leaves the file open and displays messages as they are recorded. Press **Ctrl** + **C** to cancel the operation.

5 Managing Authentication and Directory Service Databases

This chapter describes how to manage the database associated with each Authentication and Directory service. This chapter includes the following topics:

- Backing Up and Restoring the Authentication and Directory Server Database
- Exporting Table Data

Backing Up and Restoring the Authentication and Directory Server Database

Your VCX system includes backup and restore utilities for the VCX Authentication and Directory server database. This database includes provisioning data configured through the VCX Administrator web interface (refer to the *VCX Administration Guide*).

3Com recommends regular database backups. You should also back up this database before performing any upgrades. If the upgrade fails and you must downgrade, use the restore utility to repopulate the database.

You cannot back-up an older version of the IP Telephony Server and restore it to a newer version. It must be the same version.

Backing Up the VCX Authentication and Directory Server Database

VCX systems, whether single-site or multi-site, typically include redundant pairs of servers. The steps in this section describe how to backup the database on one VCX Authentication and Directory server. Depending on the reason for the backup, this server may be the primary or secondary server.

For example, if you are performing a routine database backup, you would execute the steps on the machine hosting the primary Authentication and Directory server. However, if the primary Authentication and Directory server database is corrupt, you would execute the steps on the machine hosting the secondary Authentication and Directory server (so you could restore the database on the primary).

To run the VCX Authentication and Directory server database backup utility:

1. Log in to the server hosting Tomcat using the *tomcat* account.

   Depending on your VCX configuration, Tomcat runs on either the IP Telephony server, the IP Telephony and IP Messaging server, or the Call server.

2. Enter the following commands to change the directory and stop Tomcat:

   ```
   cd /opt/3com/VCX/scripts/rc3.d
   ./S70tomcat stop
   ```

3. Log in to the server hosting the Authentication and Directory service using the *cworks* account.

   Depending on your VCX configuration, the Authentication and Directory service runs on either the IP Telephony server, the IP Telephony and IP Messaging server, or the Authentication and Directory (standalone) server.

4 Enter the following commands to change the directory and stop the VCX Authentication and Directory service.

```
cd /opt/3com/VCX/scripts/rc3.d
./S20vcxdata stop
```

5 Enter the following commands to start the VCX Authentication and Directory server database backup utility:

```
cd /opt/3com/VCX/vcxdata/bin
./backupVcxdata
```

The utility prompts you to verify that Tomcat and the VCX Authentication and Directory server services are stopped.

Enter **`y`** to confirm the services are stopped.

The `Enter the VCX Site Identification i.e. Site Id` prompt appears.

6 Enter the site ID of the Master Definition site.

A backup file named *vcxdata<site ID>backup.<version number>.tgz* is generated and saved in the */opt/3com/VCX/vcxdata/db/export/* directory. Unless you plan to use this backup file immediately to restore the database on another server, you should copy the file to an archive server.

7 Restart the Tomcat and the VCX Authentication and Directory services.

a Log in to the server hosting Tomcat using the *tomcat* account and enter the following commands:

```
cd /opt/3com/VCX/scripts/rc3.d
./S70tomcat start
```

b Log in to the server hosting the Authentication and Directory service using the *cworks* account and enter the following commands:

```
cd /opt/3com/VCX/scripts/rc3.d
./S20vcxdata start
```

Restoring the VCX Authentication and Directory Server Database

VCX systems, whether single-site or multi-site, typically include redundant pairs of servers. The steps in this section describe how to restore an archived database backup file on a pair (primary and secondary) of VCX Authentication and Directory servers. The procedure also assumes database replication is enabled between the two servers. Depending on the reason for the restoration, you may need to execute the steps on only one server.

To run the VCX Authentication and Directory server database restore utility:

1. Log in to the server hosting the Authentication and Directory database backup file. The steps in this procedure assume the backup file is located on another Authentication and Directory server. Log in using the *cworks* account.
2. Enter the following command to change to the directory where backup files are located:

   ```
   cd /opt/3com/VCX/vcxdata/db/export
   ```

3. Enter the following secure copy command, using the password *cworks*, to copy the *vcxdata<site ID>backup.<version number>.tgz* file generated by the backup utility to the */opt/3com/VCX/vcxdata/db/import* directory.

   ```
   scp vcxdata<site ID>backup.*.tgz cworks@<IP address of
   primary Authentication and Directory
   server>:/opt/3com/VCX/vcxdata/db/import
   ```

   If you are prompted to verify the authenticity of the host, enter **y**. This permanently adds the IP address to the list of known hosts.

   Repeat step 3 to copy the backup file to the secondary Authentication and Directory server.

CAUTION: *When you use the scp command to copy the database backup files to the down server, you may see a warning message about a "man in the middle" attack. This message indicates that the security key that was associated with the down server has changed, and the running server does not recognize the down server's new security key. The change to the security key is a normal consequence of the disk replacement process.*

To resolve this issue, locate the `known_hosts` *file on the running server (*`/opt/home/cworks/.ssh/known_hosts`*) and perform one of these actions:*

- *Edit the file, locate the line that contains the IP address of the down server, and replace the old key with the new key.*
- *Edit the file, locate the line that contains the IP address of the down server and remove that line.*
- *Delete the* `known_hosts` *file. If you use this method, the next time you try to access any of the other VCX servers using commands such as*

scp or ssh, you will be prompted to confirm that you want to trust the target server.

1. Log in to both the primary and secondary servers hosting Tomcat using the *tomcat* account.

   Depending on your VCX configuration, Tomcat runs on either the IP Telephony server, the IP Telephony and IP Messaging server, or the Call server.

2. Enter the following commands, on each server, to change the directory and stop Tomcat:

   ```
   cd /opt/3com/VCX/scripts/rc3.d
   ./S70tomcat stop
   ```

3. Log in to both the primary and secondary Authentication and Directory servers.as user *cworks*.

   Depending on your VCX configuration, the Authentication and Directory service runs on either the IP Telephony server, the IP Telephony and IP Messaging server, or the Authentication and Directory (standalone) server.

4. Enter the following commands, on each server, to change the directory and stop the VCX Authentication and Directory service.

   ```
   cd /opt/3com/VCX/scripts/rc3.d
   ./S20vcxdata stop
   ```

5. Enter the following command on both the primary and secondary Authentication and Directory servers:

   ```
   cd /opt/3com/VCX/vcxdata/bin
   ```

6. Enter the following command on the primary VCX Authentication and Directory server to drop replication:

   ```
   ./dropReplication
   ```

7. Enter the following command on both the primary and secondary servers to restore the VCX Authentication and Directory server database:

   ```
   ./restoreVcxdata
   ```

   The utility prompts you to verify that Tomcat and the VCX Authentication and Directory server services are stopped.

   Enter **`y`** to confirm the services are stopped.

   The `Enter the VCX Site Identification i.e. Site Id` prompt appears.

8 Enter the site ID of the Master Definition site.

The *vcxdata<site ID>backup.<version number>.tgz* back up file located at */opt/3com/VCX/auth/db/import/* is restored to the VCX Authentication and Directory server database.

9 Enter the following command on the primary VCX Authentication and Directory server to start replication:

`./setupReplication`

The `Enter the VCX Site Identification i.e. Site Id` prompt appears.

a Enter the site ID of the Master Definition site.

The `Enter the Number of MASTER SITEs other than the MASTER DEFINITION SITE` prompt appears.

To determine the number of Master Sites associated with this office, use the *listVcxdata* command. See Verifying the Number of VCX Data Schemas in a Region for more information.

b Enter the number of Master sites.

The `Enter the MASTER DEFINITION SITE IP Address [IP address]` prompt appears.

c Enter the IP Address of the Master Definition site.

The `Enter the MASTER SITE 1 IP Address [0.0.0.0]` prompt appears. If the configuration includes more than one Master Site, this question repeats until the number of master sites specified in a previous question is reached.

d Enter the IP Address of each Master Sites.

10 Once the replication is complete, use the **`./checkReplication`** command and verify the command returns *NORMAL* status.

11 Restart the Tomcat and the VCX Authentication and Directory services on both the primary and secondary servers.

a Enter the following commands to change the directory and start Tomcat:

`cd /opt/3com/VCX/scripts/rc3.d`

`./S70tomcat start`

b To start the VCX Authentication and Directory server, enter the following commands:

```
cd /opt/3com/VCX/scripts/rc3.d
./S20vcxdata start
```

Exporting Table Data

Use the CWDATA package to export tables into flat files. Export data as follows:

- For one table in a schema (except the runtime tables). See Exporting Table Data for a Single Table.
- For all the tables under one schema (except the runtime tables). See Exporting Table Data for all Tables.

Exporting data saves the current configuration.

Exporting Table Data for a Single Table

Data for a single table can be exported to the export directory listed in the Oracle initialization folder.

Runtime tables cannot be exported.

To export data for a single table:

1. From a SQL Plus command line, login as <*schema*>.
2. Execute the following:

   For this procedure, change the following to match the system:

   - *Change the value of* **p_dir** *to the export directory.*
   - *Change the* **p_tabname** *to the name of the table being exported.*
   - *Make sure to enter the procedure name* **EXACTLY** *as shown.*

```
SET SERVEROUTPUT ON
declare
   p_dir varchar2(255);
p_tabname varchar2(255);
begin
      p_dir:='/tmp/export';
      p_tabname:='table_name';
      cwdata.DUMP_ONE_TAB(p_dir, p_tabname);
end;
```

Exporting Table Data for all Tables

Data for all tables can be exported in a schema to the export directory listed in the Oracle initialization folder.

Runtime tables cannot be exported.

To export all the tables in a schema:

1 From a SQL Plus command line, login as *<schema>*.

2 Execute the following:

For this procedure, change the following to match the system:

- *Change the value of* **p_dir** *to the export directory.*
- *Make sure to enter the procedure name* **EXACTLY** *as shown.*

```
SET SERVEROUTPUT ON
declare
p_dir varchar2(255);
begin
      p_dir:='/tmp/export';
      CWDATA.DUMP_ALL_TAB(p_dir);
end;
```

Importing Saved Table Data

Once saved, (see Exporting Table Data) the data can be imported into any Authentication and Directory server database as long as the version numbers for the exporting and importing servers match.

The following methods may overwrite existing files in the /opt/3com/VCX/<schema>/db/<schema>/bulkload directory. To prevent files from being overwritten, rename or move the current .txt files.

If the data in the database and the data being importing have duplicated data, the duplicate data needs to be cleared before loading custom data. Tables need to be manually edited using a graphic tool such as Oracle DB Studio if the entire database is not being cleared.

Import the saved table data as follows:

- To install a new back-end server database, before bulk loading, copy the exported files to the /opt/3com/VCX/<schema>/db/<schema>/bulkload directory and then load the data into the database.
- To add the exported data to an existing database that already has data loaded, copy the exported files to the /opt/3com/VCX/<schema>/db/<schema>/bulkload directory and then load the data into the database one table at a time.

Clearing the Configurable Tables

Use this procedure to clear all the data tables in either the Accounting service, or the Authentication and Directory server.

Once data is deleted it must be reloaded from the text files.

To clear the configurable tables from the back-end server database:

1. Log on to the directory server as *cworks*.
2. Change to the */opt/3com/VCX/<schema>/bin* directory:

   ```
   cd /opt/3com/VCX/<schema>/bin
   ```

3. Clear the data by entering the following command:

   ```
   ./besbulkload.pl -s <TNSname> -n <schema> -p
   <schema_password> -clear
   ```

6 Manually Configuring Multi-Master Replication

This chapter describes Multi-Master Replication (MMR) and how to manually configure it in your VCX system.

This chapter includes the following topics:

- Multi-Master Replication Overview
- Replicated Table Location
- Manually Configuring Replication for an IP Telephony Server or IP Telephony and Messaging Server
- Manually Configuring Region to Region Replication
- Verifying Replication at a Branch Office
- Verifying the Number of VCX Data Schemas in a Region
- Deleting Replication Errors

Multi-Master Replication Overview

Multi-Master Replication (MMR) is the process of copying and maintaining database tables in multiple databases that make up a distributed database system. Changes applied at one site are captured and stored locally before being forwarded and applied at each of the remote locations.

Oracle replication is a fully integrated feature of the Oracle server; it is not a separate server. 3Com recommends and only supports MMR, which is comprised of multiple master sites equally participating in an update-anywhere model. Updates made to an individual master site are sent to all other participating master sites.

Some advantages to MMR include:

- Supports highly available data access by remote sites.
- Provides data that is updated frequently and propagated automatically.
- Allows real-time data propagation.
- Can provide failover protection.

When you set up MMR, the databases to be replicated must be in the same state. If, for example, database A has been populated with provisioning data and database B is empty, you can set up replication between A and B but A's data will not be copied to database B. In this case, you must back up database A and restore it on database B, then set up replication (see Backing Up and Restoring the Authentication and Directory Server Database*).*

Replicated Table Location

The tables located in the */opt/3com/VCX/vcxdata/db/vcxdata/bulkload* directory are automatically replicated.

These tables make up the VCX Authentication and Directory Services database schema.

Manually Configuring Replication for an IP Telephony Server or IP Telephony and Messaging Server

This section provides instructions on how to manually perform database replication for these two configurations:

- Regional *IP Telephony Server* — An *IP Telephony Server* configuration includes the Accounting Services, the Call Records Services, the Call Processor, and the Authentication and Directory Services.

  In this case there is only one "Region", the single site. One server is designated as the Primary, and one is designated the Secondary.

- Regional *IP Telephony and Messaging Server* — An *IP Telephony and Messaging Server* configuration includes the Accounting Services, the Call Records Services, the Call Processor, IP Messaging Services, and the Authentication and Directory Services.

  In this case there is only one "Region", the single site. One server is designated as the Primary, and one is designated the Secondary.

For these configurations replication must be started manually with the *setupReplication* script.

1 Perform the following steps on the primary and secondary servers.

a Login as *root*.

b Enter the following commands:

```
modfw -p oracle allow <IP address of eth0 for the other server>
```

```
modfw -p oracle allow <IP address of eth1 for the other server>
```

c Stop the VCX Authentication and Directory server.

```
cd /opt/3com/VCX/scripts/rc3.d
```

```
./S20vcxdata stop
```

d Stop the Tomcat application.

```
./S70tomcat stop
```

Remember to perform these steps on each server (primary and secondary).

2 On the primary server log in as *cworks* and enter these commands:

```
cd /opt/3com/VCX/vcxdata/bin
```

```
./setupReplication
```

The script starts to run.

3 Enter the requested information.

The `Enter the VCX Site Identification i.e. Site Id:` appears.

4 Enter the site ID of the office you are logged into.

The `Enter the Number of MASTER SITEs other than the MASTER DEFINITION SITE [1]` prompt appears.

Since there are only 2 servers in this configuration, enter 1. Typically, the primary server is the Master Definition Site and the secondary server is the Master Site.

5 Enter 1 for the total number of Master Sites in configuration.

The `Enter the MASTER DEFINITION SITE IP Address [0.0.0.0]` prompt appears.

6 Enter the IP Address of the secondary regional server, which is the Master Site.

The `Enter the MASTER SITE 1 IP Address [0.0.0.0]` prompt appears.

7 Enter the IP Address of the primary server (Master Definition Site).

The schema name and IP addresses of the Master Definition Site (primary server) and Master Site (secondary server) are listed.

The `Do you want to continue with the above settings ? [n/y]` prompt appears.

8 Enter **`y`** to configure replication between the primary and secondary regional server.

After 20 minutes, check the status of the replication.

9 To check replication, enter these commands while logged in as *cworks*:

```
cd /opt/3com/VCX/vcxdata/bin
./checkReplication
```

When the *NORMAL* Status returned, you know the replication is configured.

10 Login as *root* and enter these commands on the primary and secondary servers.

```
cd /opt/3com/VCX/scripts/rc3.d
./S20vcxdata start
./S70tomcat start
```

Replication is now configured and running.

Manually Configuring Region to Region Replication

For multi-site configurations with 2 Regions, each region contains a replicated copy of the other region's database.

For example, consider a multi-site configuration with two regions, Region 1 and Region 2. Each region has two Authentication and Directory server databases.

- R1DB is the primary database located on Region 1.
- R2DB' is Region 2's replicated database located on Region 1
- R2DB is the primary database located on Region 2.
- R1DB' is Region 1's replicated database located on Region 2.

This section provides instructions on how to install a replicated VCX Authentication and Directory server database.

1 Install the Region 2 VCX Authentication and Directory server database (R2DB') on the VCX Authentication and Directory server for Region 1.

a Log on as *cworks* on the primary Region 1 VCX Authentication and Directory server and enter these commands:

```
cd /opt/3com/VCX/vcxdata/bin
./installVcxdata
```

b Select option 2 to BACKUP ROCSA.

c Enter the VCX Site ID of Region 2 when prompted.

The `Do you want to continue with the above settings ? [n/y]` prompt appears.

d Enter **`y`**.

2 Install the Region 1 VCX Authentication and Directory server database (R1DB') on the VCX Authentication and Directory server for Region 2.

a Log on as *cworks* on the primary Region 2 VCX Authentication and Directory server and enter these commands:

```
cd /opt/3com/VCX/vcxdata/bin
./installVcxdata
```

b Select option 2 to BACKUP ROCSA.

c Enter the VCX Site ID of Region 1 when prompted.

The `Do you want to continue with the above settings ? [n/y]` prompt appears.

d Enter **y**.

3 If you are setting up replication *after* provisioning data has been added to the regional database, the following procedure for backing up and restoring data must be performed; otherwise, continue with step 4.

Backing up and restoring databases is not necessary if replication is set up after a fresh install on the Authentication and Directory servers (in other words, there is no data in the databases).

a On the Region 1 Call server, log in as *root* and enter these commands:

```
cd /opt/3com/VCX/scripts/rc3.d
./S70tomcat stop
```

b On the Region 2 Call server, log in as *root* and enter these commands:

```
cd /opt/3com/VCX/scripts/rc3.d
./S70tomcat stop
```

c On the Region 1 VCX Authentication and Directory server, log in as *root* and enter these commands:

```
cd /opt/3com/VCX/scripts/rc3.d
./S20vcxdata stop
```

d Log in as *cworks* and enter these commands:

```
cd /opt/3com/VCX/vcxdata/bin
./backupVcxdata
cd /opt/3com/VCX/vcxdata/db/export
```

There should be a single file with this format:
`vcxdata<region1_siteID>backup.<vcx_data_version>.tgz`

e To transfer the file to the VCX Authentication and Directory server in Region 2, enter these commands:

```
scp vcxdata<region1_siteID>backup.<vcx_data_version>.tgz
cworks@<region2_IPaddress>:/opt/3com/VCX/vcxdata/db/export
```

f Log onto the Region 2 VCX Authentication and Directory server as *root*, and enter these commands:

```
cd /opt/3com/VCX/scripts/rc3.d
./S20vcxdata stop
```

g Log in as *cworks*, and enter these commands:

```
cd /opt/3com/VCX/vcxdata/bin
./restoreVcxdata
```

h Enter the Site ID for Region 1.

i Enter these commands:

```
./backupVcxdata
cd /opt/3com/VCX/vcxdata/db/export
```

There should be a single file with this format:

```
vcxdata<region 2 site ID>backup<vcx data version>.tgz
```

j To place the file on the VCX Authentication and Directory server in Region 1, enter these commands:

```
scp vcxdata<region2_siteID>backup.<vcx_data_version>.tgz
cworks@<region1_IPaddress>:/opt/3com/VCX/vcxdata/db/export
```

k Log in to Region 1's VCX Authentication and Directory server as *cworks* and enter these commands:

```
cd /opt/3com/VCX/vcxdata/bin
./restoreVcxdata
```

l Enter the Site ID for Region 2.

4 Set up replication on both of the VCX Authentication and Directory servers.

a Verify that Tomcat on Region 1's Call server is stopped.

b On Region 1's VCX Authentication and Directory server, login as *cworks* and enter these commands:

```
cd /opt/3com/VCX/vcxdata/bin
./setupReplication
```

c Enter Site ID of Region 1.

d For the Master Definition Site enter the IP address of Region 1.

e For the Master Site enter the IP address of Region 2.

f If not already stopped, stop Tomcat on the Region 2 Call server.

g On Region 2's VCX Authentication and Directory server, login as *cworks* and enter these commands:

```
cd /opt/3com/VCX/vcxdata/bin
./setupReplication
```

h Enter Site ID of Region 2.

i For the Master Definition Site enter the IP address of Region 2.

j For the Master Site enter the IP address of Region 1.

k On each VCX Authentication and Directory server run *checkReplication* to verify replication is normal.

l Log in as *cworks* and enter these commands:

```
cd /opt/3com/VCX/vcxdata/bin
./checkReplication
```

m Restart Tomcat on each region's Call serve. Log in as *root* and enter these commands:

```
cd /opt/3com/VCX/scripts/rc3.d
./S70tomcat start
```

n Restart the Authentication and Directory service on each region's Authentication and Directory server. Log in to each server as *root* and enter these commands:

```
cd /opt/3com/VCX/scripts/rc3.d
./S20vcxdata start
```

Verifying Replication at a Branch Office

Database replication between a branch office and the regional office associated with the branch is started automatically when VCX software is installed on the branch. This section describes how to verify that replication is enabled.

For replication of branch databases, the host Regional data server of the branch office is always the Master Definition Site.

Use the following procedure to verify the branch office replication with the host Regional VCX Authentication and Directory server.

1 Login on the branch office for which you want to verify replication as *cworks* and enter these commands:

```
cd /opt/3com/VCX/vcxdata/bin
./checkReplication
```

The script starts to run.

The `Enter the VCX Site Identification i.e. Site Id:` appears.

2 Enter the site ID of the branch office you are logged into.

The *Enter the Number of MASTER SITEs other than the MASTER DEFINITION SITE [1]:* prompt appears.

To determine the number of Master Sites associated with this branch, use the *listVcxdata* command. See Manually Configuring Replication for an IP Telephony Server or IP Telephony and Messaging Server on page 91 for more information.

3 Enter the number total number of Master Sites (including the branch office you are logged on to) in this branch office's cluster.

The `Enter the MASTER DEFINITION SITE IP Address [10.10.10.10]` prompt appears.

4 Enter the IP Address of the primary regional server, which is the Master Definition Site.

Depending on the number of Master Sites associated with this branch office, you will be prompted with the *Enter the MASTER SITE <n> IP Address [0.0.0.0]* prompt until all Master Site IP Addresses have been entered.

5 Enter the IP Address of each Master Site.

When the *NORMAL* Status returned, you know the replication is configured. This script can take 20-45 minutes to output the status.

Verifying the Number of VCX Data Schemas in a Region

The *listVcxdata* command lists the Master Definition Site (depending on which server this command is issued at) and all of the Master Sites in the same cluster as the Master Site you are logged on to. Both the Master Definition Site and Master Sites are considered VCX data schemas.

A Master Definition Site is a primary regional office and a Master Site is any other office (regional or branch) within the network.

The *listVcxdata* command lists the names of the database schemas; it does not show the IP addresses of the regional and branch offices. For this reason, it is helpful to have a unique description for each office, such as including the site ID to help you better identify what is being listed when the *listVcxdata* command is executed.

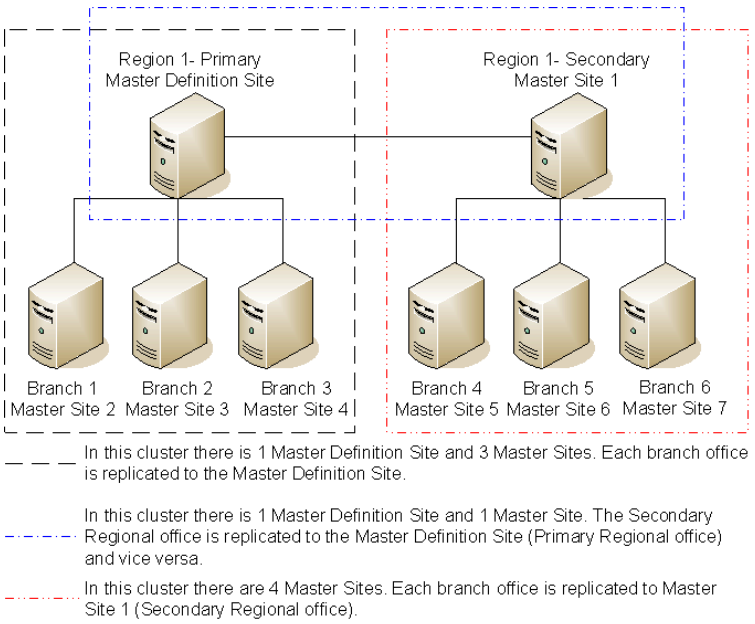
Figure 1 shows how the servers are configured and how you would determine how many Master Sites would be in each cluster. A cluster is defined as a group of servers that replicate to each other.

Branch offices 1 through 3 replicate to Region 1 (primary), but since Region 1 (primary) is the Master Definition Site, there are only 3 Master sites in this cluster.

Branch offices 4 through 6 replicate to Region 1 (secondary), which is considered a Master Site since it is not the primary regional office. This cluster has 4 Master Sites in it.

If you executed the *listVcxdata* command on branch 4, no Master Definition Site would be listed, just the 4 Master Sites since the Master Definition site is not in the same cluster as that branch.

Figure 1 Replication Setup between Master Definition Site and Master Sites


Region 1- Primary
Master Definition Site
Region 1- Secondary
Master Site 1
Branch 1
Master Site 2
Branch 2
Master Site 3
Branch 3
Master Site 4
Branch 4
Master Site 5
Branch 5
Master Site 6
Branch 6
Master Site 7
In this cluster there is 1 Master Definition Site and 3 Master Sites. Each branch office is replicated to the Master Definition Site.
In this cluster there is 1 Master Definition Site and 1 Master Site. The Secondary Regional office is replicated to the Master Definition Site (Primary Regional office) and vice versa.
In this cluster there are 4 Master Sites. Each branch office is replicated to Master Site 1 (Secondary Regional office).

To list all of the VCX data schemas associated with the server you are logged on to:

1 Login on the office you want to verify the number of associated offices for as *cworks* and enter these commands:

```
cd /opt/3com/VCX/vcxdata/bin
./listVcxdata
```

The script lists all of the VCX data schemas found.

```
61REG1CHICAGO
```

```
BRANCH1StLOUIS
BRANCH2MADISON
VCXDATA Schema Count: 3
```

Deleting Replication Errors

This section provides details on how to use the VCX replication error deletion script. Replication errors occasionally need to be deleted (for instance, before you perform an upgrade).

To delete replication errors, log onto the server hosting the VCX Authentication and Directory server as *cworks* and enter these commands:

```
cd /opt/3com/VCX/vcxdata/bin
./deleteReplicationErrors
```

7 Reconfiguring a VCX Server

This chapter describes how to reconfigure a VCX server using the `vcx-reconfigure` command. This chapter includes the following topics:

- Reconfiguration Overview
- Sample VCX Server Reconfiguration

Reconfiguration Overview

Reconfiguring a VCX server enables you to modify its networking parameters and the configuration of the services that run on the server.

You may decide to reconfigure a VCX server if, for example, you are moving it to a new subnetwork or if you are expanding your VCX system to include additional servers and need all servers to work together in the new configuration.

If you reconfigure any server in a VCX system, you must usually reconfigure all of the other servers in the system because the servers all share information.

A significant step in the reconfiguration is dropping database replication. Reconfigure primary servers and then secondary servers.

CAUTION: *Do not reboot a server immediately after reconfiguring it. Instead, after you have reconfigured all servers, reboot them all at once.*

To reconfigure a VCX server, enter this command on the console:

```
vcx-reconfigure
```

CAUTION: Do not *run this command using a remote (ssh) login. The script restarts networking at one point and you will lose your connection.*

You cannot use the `vcx-reconfigure` command to change these items:

- **Configuration Type** — You cannot modify a Call Processing Server to become an IP Messaging Server
- **Role** — You cannot change a primary server to a secondary server. Also, you cannot change the services a server has been configured to supply. For example, a server configured (during VCX software installation) to provide Call Records services cannot be reconfigured to provide IP Telephony services.
- **Site ID** — Once configured, the site ID must remain the same.
- **Global versus Local Messaging** — You cannot change this setting after it has been initially configured.
- **System Speed Dial Master** — After a server has been configured as the master server for configuring system speed dials, it must remain the master. Similarly, no other server, once it has been configured to not be a system speed dial master server can become the master server.

Sample VCX Server Reconfiguration

The sample reconfiguration script in this section is based on a two-server configuration. The changes made are described in Table 9. Any configuration parameters not listed in Table 9 remain unchanged.

Table 9 Changes in Server Configuration

Parameter	Original Value	New Value
IP Address (eth0)	10.230.64.30	10.230.64.40
IP Address (eth1)	10.230.64.31	10.230.64.41
Partner IP Address (eth0)	10.230.66.30	10.230.67.40
Partner IP Address (eth1)	10.230.66.31	10.230.67.41
Server Name	test-one	test-three
Site Description	Site One	Site Three
Partner Server Name	test-two	test-four
Partner Site ID	testtwo	testfour

Sample VCX Reconfiguration Script

```
--------------------------------------------------------------------------------
--------------- Welcome to the VCX Reconfiguration Utility ----------------
--------------------------------------------------------------------------------
This utility allows a previously configured VCX system to be reconfigured -
for example, to change its IP address or the IP addresses of other VCX
servers with which it communicates.

To accomplish this, it is necessary to carry out several steps including
stopping VCX services. If certain parameters are changed, it may also be
necessary to discontinue any replication which may be occurring with other
servers. Therefore, this utility should only be run on a system which is
not in active use.

Following reconfiguration, you must follow the VCX documentation to bring
all servers back online and to re-establish replication if it was dropped.
The correct procedures must be followed for this process to succeed.

Do you wish to reconfigure the system at this time? [no] : yes

Starting reconfiguration.

---------------------- Preparing For Reconfiguration ----------------------

VCX services are currently running - stopping them now.
Stopping VCX Services:
Stopping vcx/devdnldsvr:  [  OK  ]
Stopping vcx/callp:  [  OK  ]
Stopping vcx/tomcat:  [  OK  ]
Stopping vcx/ums:  [  OK  ]
Stopping vcx/bssxml:  [  OK  ]
Stopping vcx/acctxml:  [  OK  ]
Stopping vcx/vcxglobaldir:  [  OK  ]
Stopping vcx/vcxdata:  [  OK  ]
Stopping vcx/upsmon:  [  OK  ]
Stopped VCX Services: 9 stopped.

Do you want to change this system's networking configuration?  Answer 'yes'
if you want to modify the system's IP addresses, default gateways, or
hostname.  If you say 'yes' here, replication will be dropped if it is in
use.

Note: If you are *only* changing the system's NTP, DNS, or timezone
configuration, you can use 'vcx-config-network' instead of
'vcx-reconfigure'.
```

Sample VCX Reconfiguration Script (continued)

```
Do you want to change any networking configuration? [no] :yes

Dropping replication - please wait.

Copyright (C) 2005 3COM Corporation.  All rights reserved.

Multi-Master Replication DROP Start Configuring ....

Enter the VCX Site Identification i.e. Site Id: ?? []:testone
```

Enter the site ID for this server.

```
Enter the Number of MASTER SITEs other than the MASTER DEFINITION SITE [1]:

Enter the MASTER DEFINITION SITE IP Address [10.230.64.30]:10.230.64.40
```

The term "Master Definition Site" is an Oracle term. In this sample script, the term equates to the primary server (the server that we are now configuring). Authentication and Directory tasks are associated with the eth0 network interface. The script prompts you with the existing IP address of eth0 on this server. Enter the new IP address for eth0.

```
Enter the MASTER SITE 1 IP Address [0.0.0.0]:10.230.67.40
```

The term "Master Site" is an Oracle term. In this sample script, the term equates to the secondary server. Authentication and Directory tasks are associated with the eth0 network interface. Enter the IP address of eth0 on the secondary VCX server.

```
For 3Com VCX Multi-Master Replication DROP ...
-----------------------------------------------------
NAME'S OF SCHEMA TO DROP REPLICATION : vcxdatatestone
-----------------------------------------------------
MASTER DEFINITION SITE IP Address    : 10.230.64.40
-----------------------------------------------------
MASTER SITE 1          IP Address    : 10.230.67.40
-----------------------------------------------------

Do you want to continue with the above settings ? [n/y]:y
```

Enter y *to accept the information that you have entered, or enter* n *to change one or more of the items. If you enter n, the script prompts you with the current value for each item and allows you to change it.*

```
3Com VCX Multi-Master Replication DROP ... continue with User Inputs
```

Sample VCX Reconfiguration Script (continued)

```
VCXDATATESTONEX Database Multi-Master Replication DROP Process starting ...
For Log Details Refer to ../log/replication_VCXDATATESTONEX_DROP200503300731.log
Dec 14, 2005 9:05:25 AM com.coms.replication.run.Start dropReplication
INFO:
-------------------------------------------
3Com VCXDATATESTONEX Database ...
Multi-Master Replication DROP:

***********************************
************** COMPLETE **************
***********************************
-------------------------------------------

Dropping replication succeeded.
```

When you see this message, the database replication that was previously active has been deactivated (dropped).

The script now presents the network parameters and allows you to change them.

```
------------------------------------------------------------------------------
-------------------- VCX Network Configuration Utility --------------------
------------------------------------------------------------------------------

This wizard reconfigures networking and related services.  The current
values of networking parameters will be displayed and you will be able to
make any changes necessary.

--------- Configuring Dynamic Host Configuration Protocol (DHCP) ----------

VCX servers can use DHCP for automated configuration, but this requires
that the DHCP server is configured to provide the proper options.  Unless
you know that your environment is set up in this way, you should say 'no'
here and configure static network parameters.

Use DHCP on eth0 to configure network parameters? [no] :
```

Sample VCX Reconfiguration Script (continued)

```
------------------------- Configuring Hostname --------------------------
Enter system hostname     : test-three
```

In this sample script, the host name is being changed from test-one *to* test-three.

```
--------------------- Configuring IP Interface 'eth0' --------------------
IP Address                : 10.230.64.40
Network Subnet Mask       : 255.255.255.0
Default Gateway Address   : 10.230.64.254
```

In this sample script, the IP address of eth0 is being changed from 10.230.64.30 *to* 10.230.64. 40. *Other parameters remain unchanged.*

```
--------------------- Configuring IP Interface 'eth1' --------------------
Interface State           : enabled
IP Address                : 10.230.64.41
Network Subnet Mask       : 255.255.255.0
Default Gateway Address   : 10.230.64.254
```

In this sample script, the IP address of eth1 is being changed from 10.230.64.31 *to* 10.230.64. 41. *Other parameters remain unchanged.*

```
------------------------- Configuring DNS Servers -------------------------
Enter DNS servers one at a time.
When done, enter 0.0.0.0 to stop.

Primary DNS Server        : 10.25.10.31
Secondary DNS Server      : 10.26.10.31
Tertiary DNS Server       : 10.27.10.31
```

In this sample script, DNS server IP addresses remain unchanged.

```
----------------------- Configuring DNS Search Path ----------------------
Press Enter to leave the current path unchanged, or specify
a new search path, with spaces separating each entry.

DNS Search Path : yourcompany.com
```

In this sample script, the DNS search path remains unchanged.

Sample VCX Reconfiguration Script (continued)

```
-------------------- Configuring Network Time Protocol --------------------
Enter NTP servers one at a time.
When done, enter 0.0.0.0 to stop.

Primary NTP Server       : 10.35.10.51
Secondary NTP Server     : 10.36.10.51
```

In this sample script, NTP server IP addresses remain unchanged.

CAUTION: *If VCX systems are not synchronized via NTP, timing-related problems can occur.*

```
------------------------- Configuring Time Zone -------------------------

Please select a geographic location from the following list:
  1. Africa
  2. Americas
  3. Antarctica
  4. Arctic Ocean
  5. Asia
  6. Atlantic Ocean
  7. Australia
  8. Europe
  9. Indian Ocean
 10. Pacific Ocean
Enter continent [2] :
Please select a country from the following list:
  1. Antigua & Barbuda     18. Ecuador              35. Panama
  2. Anguilla              19. Grenada              36. Peru
  3. Netherlands Antilles  20. French Guiana        37. St Pierre & Miquelon
  4. Argentina             21. Greenland            38. Puerto Rico
  5. Aruba                 22. Guadeloupe           39. Paraguay
  6. Barbados              23. Guatemala            40. Suriname
  7. Bolivia               24. Guyana               41. El Salvador
  8. Brazil                25. Honduras             42. Turks & Caicos Is
  9. Bahamas               26. Haiti                43. Trinidad & Tobago
 10. Belize                27. Jamaica              44. United States
 11. Canada                28. St Kitts & Nevis     45. Uruguay
 12. Chile                 29. Cayman Islands       46. St Vincent
 13. Colombia              30. St Lucia             47. Venezuela
 14. Costa Rica            31. Martinique           48. Virgin Islands (UK)
 15. Cuba                  32. Montserrat           49. Virgin Islands (US)
 16. Dominica              33. Mexico
 17. Dominican Republic    34. Nicaragua
Enter country [44] :
```

Sample VCX Reconfiguration Script (continued)

In this sample script, the country code remains unchanged.

```
Please select a time zone from the following list:
  1. Alaska Time
  2. Alaska Time - Alaska panhandle
  3. Alaska Time - Alaska panhandle neck
  4. Alaska Time - west Alaska
  5. Aleutian Islands
  6. Central Time
  7. Central Time - Michigan - Wisconsin border
  8. Central Time - North Dakota - Oliver County
  9. Eastern Standard Time - Indiana - Crawford County
 10. Eastern Standard Time - Indiana - Starke County
 11. Eastern Standard Time - Indiana - Switzerland County
 12. Eastern Standard Time - Indiana - most locations
 13. Eastern Time
 14. Eastern Time - Kentucky - Louisville area
 15. Eastern Time - Kentucky - Wayne County
 16. Eastern Time - Michigan - most locations
 17. Hawaii
 18. Mountain Standard Time - Arizona
 19. Mountain Time
 20. Mountain Time - Navajo
 21. Mountain Time - south Idaho & east Oregon
 22. Pacific Time
Enter zone [13] :
```

In this sample script, the time zone remains unchanged.

```
Selected Time Zone:      America/New_York
```

The script displays a summary of the configuration information that you have accepted or changed.

```
-------------------------- CONFIGURATION SUMMARY --------------------------
DHCP state:     disabled

Hostname:       test-three

IP Interfaces:  Device     IP Address      Network Mask    Default Gateway
                eth0       10.230.64.40    255.255.255.0   10.230.64.254
                eth1       10.230.64.41    255.255.255.0   10.230.64.254
```

Sample VCX Reconfiguration Script (continued)

```
DNS Servers:    10.25.10.31
                10.26.10.31
                10.27.10.31
Search Domains: ne.3com.com

NTP Servers:    10.35.10.51
                10.36.10.51

Time Zone:      America/New_York
------------------------------------------------------------------------------
Is all of the above information correct? [yes] :
```

Press the Enter or Return key to accept the information. To change any of the parameters, enter no.

```
------------------------------------------------------------------------------
```

The script displays several status messages.

```
------------------------------------------------------------------------------
Please wait while the wizard completes.
Saving configuration...Done.
Restarting network services to apply changes...
Shutting down interface eth0:  [  OK  ]
Shutting down interface eth1:  [  OK  ]
Shutting down loopback interface:  [  OK  ]
Setting network parameters:  [  OK  ]
Bringing up loopback interface:  [  OK  ]
Bringing up interface eth0:  [  OK  ]
Bringing up interface eth1:  [  OK  ]
Shutting down ntpd: [  OK  ]
ntpd: Synchronizing with time server: [  OK  ]
Starting ntpd: [  OK  ]
Stopping VCX-CommonAgent:  [  OK  ]
Starting VCX-CommonAgent:  [  OK  ]
Stopping httpd: [  OK  ]
Starting httpd:  [  OK  ]
[  OK  ]
```

Sample VCX Reconfiguration Script (continued)

```
------------------------------------------------------------------------------
------------ Welcome to the VCX Service Reconfiguration Wizard ------------
------------------------------------------------------------------------------

------------------------- Configuring VCX Services -------------------------

Services running on this server need to communicate with other systems and
devices in order to operate.  In the next series of questions, you will be
asked for information about these, and for other global parameters.

The site name provides a user-friendly description of a location in a
multi-site VCX installation.  This may be used to identify a site in
certain management interfaces. The site name may be up to 255 characters
long and can contain letters, numbers, spaces, underscores, dashes, and
colons.

Enter a description for this site                       : Site Three
```

Enter the new site description for this server.

```
The Customer Name identifies the company using this VCX system.

Enter the customer name                                 : 3Com Customer

Some VCX applications can use European date ordering.  Answer 'Y' here to
enable this.

Use European date order? (Y/N) [N]                      :

In order to support "ad-hoc" conferences with more than 3 participants, the
Adhoc Conference Service is used.  This service should be enabled on this
server, unless another server dedicated to Adhoc Conferencing will be used
instead.  If available, a separate server typically provides greater
capacity and may be shared among sites.

Use the Adhoc service on this server? (Y/N) [Y]         :y
```

Press the Enter or Return key to accept the default answer. In this sample script, the default answer (Y) indicates that the Adhoc Conference Service was previously configured on this server.

Sample VCX Reconfiguration Script (continued)

```
The SIP default dialing domain is used to construct the SIP URI for
outbound SIP requests.

Enter the SIP default dialing domain                    : 1.1.1.1
```

In this sample script, the dialing domain remains unchanged.

```
The secondary Call Processor acts as a backup if the primary is down or
unreachable.

IP address of the secondary Call Processor    : 10.230.67.41
```

Call Processor tasks are associated with the eth1 network interface. Enter the IP address of eth1 on the secondary VCX server, as it will be defined after the reconfiguration.

```
The secondary Authentication & Directory Service acts as a backup to the
primary Authentication & Directory Service and provides authentication,
authorization, and certain user-specific functions.

IP address of the secondary Auth & Dir Service          : 10.230.67.40
```

Authentication and Directory tasks are associated with the eth0 network interface. Enter the IP address of eth0 on the Secondary VCX Server, as it will be defined after the reconfiguration.

```
The secondary IP Messaging Service is a backup for voice mail and other
messaging services.  In some configurations a dedicated IP Messaging Server
runs this service.

IP address of the secondary IP Messaging Service : 10.230.67.40
```

IP Messaging tasks are associated with the eth0 network interface. Enter the IP address of eth0 on the Secondary VCX Server, as it will be defined after the reconfiguration.

```
The primary Media Gateway acts as the interface between the VCX IP
Telephony system and the external telephone network.

IP address of the primary Media Gateway       : 10.230.64.15
```

In this sample script the IP address of the primary media gateway remains unchanged. Press the Enter or Return key to accept the current IP address.

Sample VCX Reconfiguration Script (continued)

```
The secondary Media Gateway is an additional interface between the VCX IP
Telephony system and the external telephone network.  If there is no
secondary Media Gateway, leave this entry blank.

IP address of the secondary Media Gateway     : 10.230.67.15
```

In this sample script the IP address of the secondary media gateway remains unchanged. Press the Enter or Return key to accept the current IP address.

```
The Call Records Service consolidates call accounting records for the VCX
system.  It is only enabled on one server for an entire installation.


Enable the Call Records Service (Y/N)? [N]              :
```

Press the Enter or Return key to accept the default answer (Y). The Call Records Service is enabled on only the Primary VCX Server.

The script displays a summary of the global parameters that you have accepted or changed.

```
---------------------- Summary of Global Parameters ----------------------

                          Site Name : Testthree
                      Customer Name : 3Com Customer
                 European Date Order : N
       Enable Adhoc Conference Service : Y
            SIP Default Dialing Domain : 1.1.1.1
              Secondary Call Processor : 10.230.67.41
         Secondary Auth & Dir Service : 10.230.67.40
        Secondary IP Messaging Service : 10.230.67.40
                  Primary Media Gateway : 10.230.64.15
                Secondary Media Gateway : 10.230.67.15
           Enable Call Records Service : Y

Do you wish to change any of the values shown? [N]      :
```

Press the Enter or Return key to accept the default answer (N). To change any of the information, enter Y.

Sample VCX Reconfiguration Script (continued)

```
--------------- Configuring additional parameters for System ---------------
```

This section allows you to change the password for each VCX system account. Press Enter to accept the current password.

```
Root account password. A blank entry means 'no change'.

Password                                                  :
Password (confirm)                                        :

Oracle account password.  A blank entry means 'no change'.

Password                                                  :
Password (confirm)                                        :

Tomcat account password.  A blank entry means 'no change'.

Password                                                  :
Password (confirm)                                        :

Cworks account password.  A blank entry means 'no change'.

Password                                                  :
Password (confirm)                                        :
```

This cworks password is used to log into the local cworks account on this server. You may be prompted later in this script for another cworks password, which is used for authentication between replicating databases. The local cworks account password and the cworks database authentication password do not have to match.

```
VCX account password.  A blank entry means 'no change'.

Password                                                  :
Password (confirm)                                        :

App account password.  A blank entry means 'no change'.

Password                                                  :
Password (confirm)                                        :

Do you wish to change any of the System parameters? [N] :
```

Sample VCX Reconfiguration Script (continued)

```
---------- Configuring additional parameters for UPS Monitoring -----------

An Uninterruptible Power Supply (UPS) can be used with VCX systems to avoid
disruption due to a power outage.  VCX provides a UPS monitoring service
which tracks the UPS's status and performs a safe shutdown when the its
battery is depleted during a long power outage.  To use this feature, you
must have a compatible UPS installed and configured in accordance with the
VCX documentation.

Enable UPS monitoring? [N]                                    : y
```

If you do not have a UPS installed and enter N (or press Return or Enter), the remaining UPS configuration prompts are not displayed.

```
It is possible to use multiple UPS units to power a single server if the
server has redundant power supplies with separate power connections.

Will multiple UPS's power this server? [N]                    : y

A single UPS can power one or more VCX systems.  A UPS 'Master'
communicates directly with a UPS, while a 'Slave' communicates with the
Master to get UPS status.  Only one 'Master' system should monitor a given
UPS.  If this VCX system is the only one connected to the UPS, say 'Y'
here.  Note: a VCX system's UPS Monitoring role is independent of any other
role it may have within a VCX deployment.

Do you want this server to be the master ? [N]                : y
```

If you answer N to indicate that this server is a slave (not the master), you will be prompted to enter the IP address of the master.

```
UPS Monitoring requires a network-enabled UPS.  Enter the IP address
assigned to the UPS's management card or Ethernet interface.  Note: The UPS
must already be configured with this address.

UPS IP address                                                : 10.230.67.50
```

Sample VCX Reconfiguration Script (continued)

```
The SNMP 'write' community string configured in the UPS is required.  (For
security reasons, it is recommended that the default value provided by the
UPS be changed.)

UPS 'write' community string                              : private
```

The string you enter here must match the SNMP write community string configured on the UPS.

```
Enter the IP address assigned to the second UPS's management card or
Ethernet interface.  Note: The UPS must already be configured with this
address.

Second UPS IP address                                     : 10.230.67.51

The SNMP 'write' community string configured in the second UPS is required.

Second UPS 'write' community string                       : private
```

The string you enter here must match the SNMP write community string configured on the UPS.

```
The VCX system polls the UPS at regular intervals to get status
information.  A shorter interval makes the system more responsive to UPS
status changes, but consumes more network bandwidth.  The default value
should work for most systems.

Polling Frequency (seconds)                               : 30
```

The default polling interval is 30 seconds.

```
A 'low battery' condition is reached when the battery charge reaches a
defined threshold percentage.

Low Battery Threshold (%)                                 : 25
```

Enter UPS battery threshold charge allowed before starting a shutdown of the VCX system. The threshold charge is expressed as a percentage of remaining battery power. The default is 25%. The range is from 25% to 75%.

```
Do you wish to change any of the UPS Monitoring parameters? [N] : n
```

Sample VCX Reconfiguration Script (continued)

```
-------- Configuring additional parameters for IP Messaging Service --------

The hostname of the other IP Messaging system is needed in order to set up
Intelligent Mirroring redundancy with this system.

Hostname of peer IP Messaging system                    : test-four
```

Enter the host name of the Secondary VCX Server, as it will be defined after the reconfiguration.

```
When multiple IP Messaging systems are in use, for example at a region and
one or more branches, the Global Voicemail capability allows these systems
to act as a single unified voicemail system.  Say 'yes' here if this system
participates in Global Voicemail.

Is Global Voicemail enabled? [N]                        : y

In a Global Voicemail system, one site's IPMSG servers are designated as
the Central Servers and coordinate the feature's operation.  Typically the
Central Servers are at one of the regional sites.

Is this a Central Server for Global Voicemail? [N]      : y
```

If you answer N to indicate that this is not the Central Server, you will be prompted to enter the Central Server IP address.

```
IP Messaging includes an optional ability to archive messages to an
external server.

Is Message Archival enabled? [N]                        :
```

Press the Enter or Return key to accept the default answer. In this sample script, the default answer (N) indicates that message archival was not originally enabled on this server.

Sample VCX Reconfiguration Script (continued)

```
IP Messaging includes an optional ability to back up messages to an
external server.

Enable data backup server for IPMS? [N]                    :
```

Press the Enter or Return key to accept the default answer. In this sample script, the default answer (N) indicates that data backup was not originally enabled on this server.

```
IP Messaging includes an optional ability to import subscriber profiles
from VCX.

Enable VCX subscriber bulk import? [Y]                     :
```

Press the Enter or Return key to accept the default answer. In this sample script, the default answer (Y) indicates that bulk import was originally enabled on this server.

```
For VCX subscriber bulk import, the user name to use when accessing the VCX
Authentication & Directory Server is needed.

User name for access to Auth & Dir Server                  : cworks

In addition, the password for the previously provided user name is
required.  Specify the password to use when accessing the VCX
Authentication & Directory Server.

Password for access to Auth & Dir Server                   : cworks
```

This cworks password is used for authentication when accessing the Authentication and Directory server database. This password must be the same as the cworks database authentication password on the Authentication and Directory server. It is not necessarily the same as the password used to log in to the local cworks account.

```
IP Messaging includes support for Text To Speech (TTS) via one or more
external servers.  To use this feature you must answer 'Y' here.

Is Text To Speech (TTS) enabled? [N]                       :
```

Press the Enter or Return key to accept the default answer. In this sample script, the default answer (N) indicates that no text-to-speech service was originally enabled on this server.

Sample VCX Reconfiguration Script (continued)

```
Do you wish to change any of the IP Messaging System parameters? [N] :
```

Press the Enter or Return key to accept the data that you have accepted or changed. To review the data and make additional changes, enter Y.

```
--------- Configuring additional parameters for Auth & Dir Service ---------

At a branch office, the password for access to the regional office system's
'cworks' account is required.  At a regional office or on a standalone
system, specify the 'cworks' password for access to *this* system.

Login Password                                          :
Login Password (confirm)                                :
```

This cworks password is used for authentication when replicating this server's database on a remote Authentication and Directory server. This password must be the same as the cworks account password on the remote server. It is not necessarily the same as the password used to log in to the local cworks account configured earlier in this script.

```
Do you wish to change any of the Auth & Dir Service parameters? [N] :
```

Press the Enter or Return key to accept the default answer (N) and make no further changes. If you want to make additional changes, enter Y.

```
------------ Configuring additional parameters for Common Agent ------------

The Trap Destination specifies the IP address to be used as a destination
when this system sends SNMP traps.

Trap Destination                                        : 10.230.64.70
```

Press the Enter or Return key to accept the IP address of the existing Network Management Station or enter a new IP address. In this sample script, the address remains unchanged.

```
The Trap Community String provides a community string to be used when
sending SNMP traps to the trap destination.

Trap Community String                                   : public
```

Press the Enter or Return key to accept the existing trap community string or enter a new string.

Sample VCX Reconfiguration Script (continued)

```
In some cases it may be desirable for SNMP Traps to be sent to multiple
destinations.  Additional Trap Destinations can be entered here.  Enter a
blank input to indicate that all destinations have been entered.

IP Address of the first additional trap destination for this system.

Trap Destination                                        : 10.230.62.31

Community String for the first additional trap destination

Trap Community String                                   : public

IP Address of the second additional trap destination for this system.

Trap Destination                                        :

The Write Community String specifies the community string to be used by a
management station when sending write requests to this system.

Write Community String                                  : private
```

Press the Enter or Return key to accept the existing write community string or enter a new string.

```
The Read Community String specifies the community string to be used by a
management station when sending read requests to this system.

Read Community String                                   : public
```

Press the Enter or Return key to accept the existing read community string or enter a new string.

Sample VCX Reconfiguration Script (continued)

```
Common Agent supports a management station authentication feature.
Answering 'Y' here will allow only a set of pre-identified SNMP management
stations to manage the system. (You will be able to enter IP addresses of
authorized management stations next.  Authorized management stations can
also be configured using EMS or another management station at a later
point.)

Enable management station authentication? [N]           :
```

Press the Enter or Return key to accept the default answer (N) and continue with no management station authentication. Enter Y if you want to specify up to four management station IP addresses.

```
Do you wish to change any of the Common Agent parameters? [N] :
```

Press the Enter or Return key to accept the default answer (N) and use the data that you have accepted or modified. Enter Y *to make additional changes.*

```
-------------------------------------------------------------------------

VCX reconfiguration is now complete.  Before the information just entered
is saved, you have the option of reviewing and changing parameters for each
VCX service at a detailed level.  This is not needed in most cases and is
recommended only for advanced users.

Do you wish to review service parameters in detail? [N] :
```

Press the Enter or Return key to accept the default answer (N). If you answer Y to this question, the script enters a mode in which you can review and modify low-level configuration parameters for each service. This is not *needed for standard configurations and using it successfully requires substantial VCX configuration expertise. 3Com does not support this mode of making configuration changes.*

```
-------------------------------------------------------------------------
Please wait while the wizard completes.
```

Sample VCX Reconfiguration Script (continued)

```
---------------------------- Applying Changes -----------------------------
```

The script displays several status messages. The last message reminds you to reboot all servers after they have all been reconfigured and to reboot them all at the same time.

```
Configuring VCX components:
Configuring system: [  OK  ]
Configuring vcx-firewall-firstboot: [  OK  ]
Configuring upsmon: [  OK  ]
Configuring commagent: [  OK  ]
Configuring vcxdata: [  OK  ]
Configuring acctxml: [  OK  ]
Configuring bssxml: [  OK  ]
Configuring ums.sh: [  OK  ]
Configuring tomcat: [  OK  ]
Configuring vcxcentral: [  OK  ]
Configuring vcxprov: [  OK  ]
Configuring callp: [  OK  ]
Configuring adhoc: [  OK  ]
Configuring devdnldsvr: [  OK  ]
Configured VCX components: 12 configured.
Stopping VCX-CommonAgent:  [  OK  ]
Starting VCX-CommonAgent:  [  OK  ]
Stopping VCX-Firewall:  [  OK  ]
Starting VCX-Firewall:  [  OK  ]

Reconfiguration of components is complete.  VCX services are currently
stopped and replication has been dropped.  After all systems are
reconfigured, you must restore replication.  Then, restart VCX services (or
reboot the system).
------------------------ Reconfiguration Completed ------------------------
```

End of Sample VCX Reconfiguration Script

8 Managing Uninterruptible Power Supplies

This chapter describes how to manage one or more Uninterruptible Power Supplies (UPS) in your VCX system. It describes how to add UPS support to an existing VCX system, and how to monitor UPS status.

This chapter includes the following topics:

- UPS Overview
- Adding UPS Support to an Existing VCX System
- Monitoring UPS Status
- VCX Server Response to Power Events

UPS Overview

Critical network equipment is often connected to an Uninterruptible Power Supply (UPS) to ensure continued operation in the event of mains power loss. A server in a VCX system can be connected to, and can monitor, one or two (if the server has dual power supplies) UPS devices.

Each UPS includes a battery. The battery maintains a charge while power is supplied to the VCX system. When power fails, the UPS battery takes over until its capacity is nearly exhausted. At this point, the connected VCX system performs a graceful shutdown.

UPS monitoring lets a VCX system know when its UPS is about to run out of power so that it can shut down. When power returns and the UPS battery has recharged to a level sufficient to allow another shutdown to complete, the VCX system restarts automatically.

You can deploy a UPS in either a branch office or regional configuration.

- **Branch Offices**

  In a branch office environment, a UPS supports a VCX branch system which is typically installed on a single VCX server. Normally, a branch office does not have support staff on hand to attend to equipment, and may be unoccupied for long periods of time (nights, weekends, holidays). Consequently, if the office loses power, it is important that the VCX system automatically operate on UPS power, shut down when UPS power is about to run out, and restart when power is restored.

  In this environment, the UPS should only power the VCX system and any networking equipment (for example a router, switch, or SIP gateway) in use. The UPS should not be used to power other servers or devices which require a graceful shutdown because there is no way to coordinate the shutdown of this other equipment with the VCX system.

- **Regional Offices**

  In a regional office environment, a VCX system may include multiple VCX servers, which may share one or more UPS devices. It is also possible for multiple UPS devices to power individual servers through use of redundant power supplies.

  In this environment, the UPS must power only VCX systems and other equipment not requiring graceful shutdown.

UPS Configuration Options

For the current VCX software release, 3Com Corporation supports UPS hardware from American Power Conversion (APC) Corporation. For a list of supported APC UPS devices and VCX hardware platforms, consult with your 3Com Service Representative or your 3Com Voice Authorized Reseller.

To install and configure a UPS, follow the instructions provided by APC.

- For a new VCX system, you can set up and enable UPS support during the initial installation of VCX software (refer to the *VCX Installation Guide)*.
- For an existing VCX system, you can set up and enable UPS support using the `vcx-ups-setup` command or the `vcx-reconfigure` command. You can also use either command to modify an existing UPS configuration.
  - This chapter describes how to add a UPS to an existing VCX system using the `vcx-ups-setup` command.
  - See Chapter 7 for information on the `vcx-reconfigure` command. While you can use this command to configure UPS support, this command is more appropriate for a large scale reconfiguration where you want to modify networking parameters, services, or both on the server

A UPS functions as an SNMP network device. The UPS and a VCX system communicate using the SNMPv1 protocol. This also allows network management stations, such as EMS, to monitor the UPS remotely through a VCX server.

You can check the status of a UPS locally by using the `vcx-ups-status` command, or remotely by using EMS.

Adding UPS Support to an Existing VCX System

You can add UPS support to an existing VCX system. This section assumes that you have installed and configured the UPS device according to the manufacturer's instructions.

UPS Setup Options

You can add one or two UPS devices to your VCX system. Depending on the server configuration in your VCX system, you can:

- Set up one UPS to service a single VCX server.

- Set up two UPS devices to service a single VCX server with redundant power supplies.
- Set up one UPS to service multiple VCX servers.
- Set up two UPS devices to service multiple VCX servers through one server with redundant power supplies.

As a general rule, the power requirements of devices serviced by a UPS should not exceed 80% of UPS load capacity. 3Com Corporation recommends that you consult with you UPS vendor or reseller for sizing assistance.

When UPS support includes multiple VCX servers, one VCX server is designated the *master*. The master server acts as the coordinator for the other VCX servers, referred to as *slaves*. The master communicates with the UPS; the slaves communicate the master to get UPS status. If power requirements call for more than one UPS, the VCX system may include more than one master server. Note that the master/slave designation is entirely independent of any role (primary, secondary, or branch) that a VCX server may have within the VCX environment.

As described in VCX Software Components, VCX software can be installed on VCX servers in many different configurations. When selecting a VCX server to act as a master, follow these guidelines:

- Choose a server that is running the VCX Authentication and Directory service (preferred) or the IP Messaging service. The Authentication and Directory service can run on any of the following VCX servers (see Table 3):
  - IP Telephony and IP Messaging Server
  - IP Telephony Server
  - Authentication and Directory Server
- The master can be either the primary or the secondary server.

For example, your VCX system includes a region with an IP Messaging Server, an Authentication and Directory Server, a Call Server, and a Call Records Server, and the servers share a UPS. In this case, select the Authentication and Directory Server as the master. However, if your VCX system includes a UPS-powered Call Server and IP Messaging Server, select the IP Messaging Server as the master.

Requirements

Setting up a VCX system to use UPS power and to monitor UPS status using the `vcx-ups-setup` command requires the following configuration information for each UPS in the VCX system:

- IP address of the UPS — You must know the pre-configured IP address assigned to the UPS.
- SNMP community string — You must know the pre-configured SNMP write community string assigned to the UPS.
- Low battery threshold percentage — You must specify the battery charge level (expressed as a percentage of battery capacity) at which point the attached server (or servers) should initiate a shutdown.

You must also supply the following information for each VCX server:

- Whether a server is the master or a slave
- On each slave server, the IP address of the master VCX server

Adding Single UPS Device Support

This section describes how to configure a VCX system supported by a single UPS. Depending on your VCX configuration, this requires one or two general steps:

- If your VCX system includes a single VCX server, configure that system as the master.
- If your VCX system includes multiple VCX servers, configure one server as the master and the remaining servers as slaves.

Single UPS System – Configuring the Master VCX Server

To initially enable and configure a VCX server as the master in a single UPS system:

1. Log in, using the *root* account, to the VCX server you want to designate as the master.
2. Enter the following command:

   `vcx-ups-setup <configuration_parameters>`

   You must concatenate the following `vcx-ups-setup` command configuration parameters (responses are shown in bold):

   `-- master:` **`Y`**

   Enter **Y** (you must uppercase) to designate this server as the master.

   `-- monitormultipleups:` **`N`**

Enter **N** (you must uppercase) to indicate there is a single UPS servicing the entire VCX system.

`-- upsipaddr <`***IP Address of the UPS***`>`

Enter the IP address of the UPS. Use dotted decimal notation but do not enter leading zeros. For example, enter 10.230.63.3, *not* 010.230.063.003.

`-- community <`***community string of the UPS***`>`

Enter the SNMP community string configured on the UPS to enable communication between the master VCX server and the UPS. Typically, the community string is **private** to allow Read or Write access (however, 3Com Corporation strongly recommends that you change the default community string).

`-- bcharge <`***UPS battery threshold charge***`>`

Enter UPS battery threshold charge allowed before starting a shutdown of the VCX system. The threshold charge is expressed as a percentage of remaining battery power. The default is 25%. The range from 25% to 75%.

The following example shows the syntax required to initially configure a master VCX server:

```
vcx-ups-setup --master Y --monitormultipleups N
--upsipaddr 10.230.63.3 community private --bcharge 33
```

When this command is executed:

- UPS monitoring is enabled on the current VCX server.
- The server is designated the master.
- The VCX system will be serviced by a single UPS.
- The IP address of the UPS is 10.230.63.3.
- The community string the UPS will use to communicate with the master VCX server is private.
- The low battery threshold charge is 33%.

After the initial master VCX server configuration, you can change a parameter value by reentering the `vcx-ups-setup` command. In the following example, the low battery threshold charge is changed to 50%:

```
vcx-ups-setup --master Y --monitormultipleups N
--upsipaddr 10.230.63.3 community private --bcharge 50
```

Note that you must include all the `vcx-ups-setup` command parameters even if you are only changing a single value.

Single UPS System – Configuring a Slave VCX Server

To enable and configure a VCX server as a slave in a single UPS system:

1. Log in, using the *root* account, to the VCX server you want to designate as a slave.
2. Enter the following command:

   `vcx-ups-setup <configuration_parameters>`

   You must concatenate the following `vcx-ups-setup` command configuration parameters (responses are shown in bold):

   `-- master:` **`N`**

   Enter **N** (you must uppercase) to indicate that this server is not the master.

   `-- monitormultipleups:` **`N`**

   Enter **N** (you must uppercase) to indicate there is a single UPS servicing the entire VCX system.

   `-- upsserver <`***`IP Address of the master`***`>`

   Enter the IP address (assigned to eth0) of the VCX server acting as the master UPS monitor. Use dotted decimal notation but do not enter leading zeros. For example, enter 10.230.63.3, *not* 010.230.063.003.
3. Repeat steps 1 and 2 for all the other VCX servers in your system that you want to function as slaves.

The following example shows the syntax required to initially configure a slave VCX server:

```
vcx-ups-setup --master N --monitormultipleups N
--upsserver 10.230.63.5
```

When this command is executed:

- UPS monitoring is enabled on the current VCX server.
- The server is designated a slave.
- The VCX system will be serviced by a single UPS.
- The IP address of the master VCX server is 10.230.63.5.

After the initial slave VCX server configuration, you can change a parameter value by reentering the `vcx-ups-setup` command. In the following example, the IP address of the master VCX server is changed:

```
vcx-ups-setup --master N --monitormultipleups N
--upsserver 10.230.63.7
```

Note that you must include all the `vcx-ups-setup` command parameters even if you are only changing a single value.

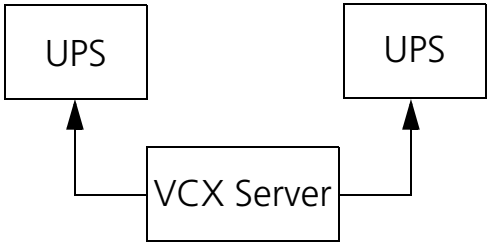
Adding Multiple UPS Support

This section describes how to configure a VCX system with multiple UPS devices.

There are two basic configuration options for a VCX system with multiple UPS devices.

- Two UPS devices can service a single VCX server with dual power supplies (see Figure 2). Each power supply receives power from a separate UPS (and if possible, you should connect each UPS to different mains circuits). The server remains fully operational when either UPS has mains power. The server shuts down automatically only when both UPS devices are on battery and at or below the low battery threshold.

Figure 2 Two UPS Devices Powering a Single VCX Server

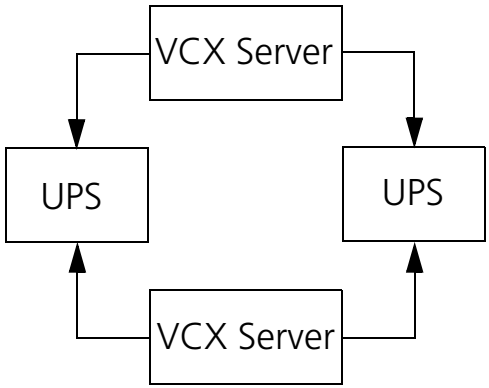


  In this case, you designate the single VCX server with dual power supplies as the master. As this is a single server VCX system, there are no slaves. When configuring the master, you identify the additional UPS device by specifying its IP address.

- Two UPS devices can support multiple VCX servers with or without dual power supplies.
  - In the most complex configurations, there may be multiple servers, each with redundant power supplies (see Figure 3). Two UPS

devices are used to provide power. For servers with redundant power supplies, ensure that each power supply is connected to a different UPS (and if possible, you should connect each UPS to different mains circuits). In this case, the servers should all remain operational unless both UPS devices are on battery and at or below the low battery threshold. At this point, a coordinated shutdown of all systems must be performed.

Figure 3 Two UPS Devices Powering Two VCX Servers

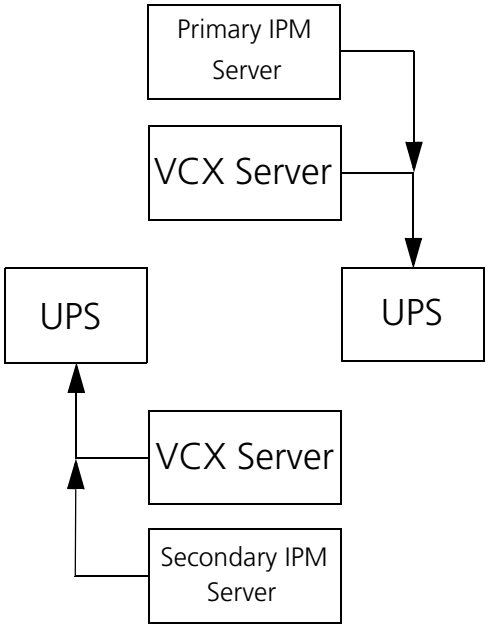


In this case, you designate one of the VCX servers as the master for both UPS devices and any other VCX servers in the system as slaves. When configuring the master, you identify the additional UPS device by specifying its IP address.

- If your VCX system includes multiple UPS devices, the servers do not have redundant power supplies, and the primary and secondary servers (of any configuration type) are co-located, then you should assign the primary and secondary servers of a given configuration type to different UPS devices (see Figure 4).

  For example, if you have a regional VCX system that has a primary IP Messaging Server and a secondary IP Messaging Server (plus other VCX servers) and you are using two UPS devices to power all the servers, put the primary IP Messaging Server on one UPS and the secondary IP Messaging Server on the other UPS. This reduces the possibility of a single failure disrupting IP Messaging service availability.

Figure 4 Two UPS Devices Powering Redundant VCX Servers



When you have multiple UPS devices, you should connect each UPS to different mains circuits if possible.

Dual UPS System – Configuring the Master VCX Server

To enable and configure a VCX server as the master in a multiple UPS system:

1. Log in, using the *root* account, to the VCX server you want to designate as the master.
2. Enter the following command:

   `vcx-ups-setup <configuration_parameters>`

   You must concatenate the following `vcx-ups-setup` command configuration parameters (responses are shown in bold):

   `-- master:` **`Y`**

   Enter **Y** (you must uppercase) to designate this server as the master.

   `-- monitormultipleups:` **`Y`**

Enter **Y** (you must uppercase) to indicate there are multiple UPS devices servicing the VCX system.

`-- upsipaddr <`***IP Address of the UPS***`>`

Enter the IP address of the first UPS. Use dotted decimal notation but do not enter leading zeros. For example, enter 10.230.63.3, *not* 010.230.063.003.

`-- community <`***community string of the UPS***`>`

Enter the SNMP community string configured on the first UPS to enable communication between the master VCX server and the UPS. Typically, the community string is **private** to allow Read or Write access.

`-- upsipaddr1 <`***IP Address of the second UPS***`>`

Enter the IP address of the second UPS.

`-- community1 <`***community string of the second UPS***`>`

Enter the SNMP community string configured on the second UPS to enable communication between the master VCX server and the UPS. Typically, the community string is **private** to allow Read or Write access.

`-- bcharge <`***UPS battery threshold charge***`>`

Enter UPS battery threshold charge allowed before starting a shutdown of the VCX system. The threshold charge is expressed as a percentage of remaining battery power. The default is 25%. The range from 25% to 75%.

The following example shows the syntax required to initially configure a master VCX server:

```
vcx-ups-setup --master Y --monitormultipleups Y
--upsipaddr 10.230.63.3 --community private
--upsipaddr1 10.230.63.4 --community1 private --bcharge 33
```

When this command is executed:

- UPS monitoring is enabled on the current VCX server.
- The server is designated the master.
- The VCX system will be serviced by a multiple UPS devices.
- The IP address of the first UPS is 10.230.63.3.
- The community string the first UPS will use to communicate with the master VCX server is private.

- The IP address of the second UPS is 10.230.63.4.
- The community string the second UPS will use to communicate with the master VCX server is private.
- The low battery threshold charge is 33%.

After the initial master VCX server configuration, you can change a parameter value by reentering the `vcx-ups-setup` command. In the following example, the low battery threshold charge is changed to 50%:

```
vcx-ups-setup --master Y --monitormultipleups Y
--upsipaddr 10.230.63.3 --community private
--upsipaddr1 10.230.63.4 --community1 private --bcharge 50
```

Note that you must include all the `vcx-ups-setup` command parameters even if you are only changing a single value.

Dual UPS System – Configuring a Slave VCX Server

To enable and configure a VCX server as a slave in a multiple UPS system:

1. Log in, using the *root* account, to the VCX server you want to designate as a slave.
2. Enter the following command:

   ```
   vcx-ups-setup <configuration_parameters>
   ```

   You must concatenate the following `vcx-ups-setup` command configuration parameters (responses are shown in bold):

   `-- master:` **N**

   Enter **N** (you must uppercase) to indicate that this server is not the master.

   `-- monitormultipleups:` **Y**

   Enter **Y** (you must uppercase) to indicate there are multiple UPS devices servicing the VCX system.

   `-- upsserver <`***IP Address of the master***`>`

   Enter the IP address (assigned to eth0) of the VCX server acting as the master UPS monitor. Use dotted decimal notation but do not enter leading zeros. For example, enter 10.230.63.3, *not* 010.230.063.003.
3. Repeat steps 1 and 2 for all the other VCX servers in your system that you want to function as slaves.

The following example shows the syntax required to initially configure a slave VCX server in a system supported by multiple UPS devices:

```
vcx-ups-setup --master N --monitormultipleups Y
--upsserver 10.230.63.5
```

When this command is executed:

- UPS monitoring is enabled on the current VCX server.
- The server is designated a slave.
- The VCX system will be serviced by multiple UPS devices.
- The IP address of the master VCX server is 10.230.63.5.

After the initial slave VCX server configuration, you can change a parameter value by reentering the `vcx-ups-setup` command. In the following example, the IP address of the master VCX server is changed:

```
vcx-ups-setup --master N --monitormultipleups Y
--upsserver 10.230.63.7
```

Note that you must include all the `vcx-ups-setup` command parameters even if you are only changing a single value.

Disabling UPS Monitoring on a VCX Server

By default, when you configure UPS support on a VCX server, monitoring is enabled. You can disable UPS monitoring on the master VCX server or on any slave servers.

Disabling UPS monitoring does not remove or modify the UPS configuration parameters entered with the `vcx-ups-setup` command.

CAUTION: *Disabling UPS monitoring blocks communication between the VCX server and the UPS. If UPS monitoring is disabled and the power fails, the VCX server runs on UPS battery power until the battery charge reaches 0. If this happens, the VCX server will not perform an orderly shutdown.*

To disable UPS monitoring on a VCX server (the master or any slave):

1. Log in, using the *root* account, to the VCX server on which you want to disable UPS monitoring.
2. Enter the following command:

```
vcx-ups-setup --disableupstools [--fullauto]
```

The optional argument **`--fullauto`** specifies that the command should run in automatic mode. In this mode, command execution does not provide any interactive prompts or queries.

Note that you can enter the **`vcx-ups-setup`** command with the optional **`--help`** argument to display information on command usage.

Monitoring UPS Status

This section describes how to check the status of a UPS

You can use the `vcx-ups-status` command to check the status of any UPS in your local VCX system, or the status of a UPS in a remote VCX system. You can enter the command on the master server or any slave server. The `vcx-ups-status` command uses the following syntax:

`vcx-ups-status (ups0 | ups1)[master-ip] [--parameter]`

You must identify the UPS you want to monitor. For a single UPS system, enter **`ups0`**. For a dual UPS system, enter either **`ups0`** or **`ups1`**, depending on the UPS you want to monitor.

The parameter **`master-ip`** is optional. Use this parameter to specify the IP address of a remote VCX UPS master server.

In addition to the required parameter **`ups0`** or **`ups1`**, you must enter one of the parameters shown in Table 10.

Table 10 vcx-ups-status Command Parameters

Parameter	Description
--upsstatus	Indicates the status of the UPS, for example **online** or **offline**.
--upsload	Indicates the load, expressed in watts, placed on the UPS by the attached VCX servers.
--upsmfr	Displays the name of the UPS manufacturer. In this case, the value is always **APC**.
--batterycharge	Indicates, as a percentage, the current battery charge.
--upsserial	Displays the manufacturer's serial number of the UPS.
--upsmodel	Displays the manufacturer's model name of the UPS.
--isconfig	Indicates whether or not (**Y** or **N**) the UPS has been configured.

Table 10 vcx-ups-status Command Parameters (continued)

Parameter	Description
--ismaster	Indicates whether or not (**Y** or **N**) this VCX server is configured as the master.
--listslaves	Lists the IP addresses of all VCX servers configured as slaves.
--all	Displays values for the following parameters: ■ upsstatus ■ upsload ■ upsmfr ■ batterycharge ■ upsserial ■ upsmodel
--help	Displays information on command usage.

The following examples of the `vcx-ups-status` command were entered on the master VCX server that is monitoring a single UPS.

The first command example uses the `--all` parameter:

```
vcx-ups-status ups0 --all

upsstatus      : online
upsload        : 033.0
upsmfr         : APC
batterycharge  : 100.0
upsserial      : ES0552000488
upsmodel       : Smart-UPS 750
```

The following commands return output not provided by the `--all` parameter:

```
vcx-ups-status ups0 --isconfig
isconfig        : Y

vcx-ups-status ups0 --ismaster
ismaster        : Y

vcx-ups-status ups0 --listslaves
10.230.188.7
```

VCX Server Response to Power Events

This section describes how UPS-supported VCX systems respond to various power events.

Power events and VCX server responses are shown in Table 11.

Table 11 VCX Server Behavior for Power Events

Event	Response
Power Loss	When one or more VCX servers are connected to a UPS and a power loss occurs, the servers continue to operate without interruption. The servers do not initiate a shutdown unless the UPS battery power level is below the threshold capacity for shutdown (for example, because the UPS battery has not yet fully recharged after a prior power loss event). A power loss event is detected by VCX software, logged through syslog, and reported as an SNMP trap.
Power Restoration Prior to Depleted Battery	If power returns while a VCX server is operating on UPS battery power, the VCX server: ■ Logs the event through syslog. ■ Generates an SNMP trap indicating return of power. ■ Resumes normal operation.
Depleted Battery	Each UPS is configured with a battery threshold. The threshold charge is expressed as a percentage of remaining battery power. The default is 25%. When the UPS battery reaches the configured threshold, a VCX server: ■ Logs this event through syslog. ■ Generates an SNMP trap indicating that shutdown is imminent. ■ Starts an orderly shutdown of services and the VCX operating system. If the VCX system has multiple UPS devices providing power, the depleted battery event occurs only when *both* UPS devices are running on battery and are at or below the low-battery threshold.

Table 11 VCX Server Behavior for Power Events (continued)

Event	Response
Final Shutdown	The UPS receives a signal to turn off after a time delay (the default is 270 seconds) to allow for the last shutdown steps to complete. The VCX system generates a trap indicating that shutdown in imminent. If multiple VCX servers are powered from the same UPS, all servers are provided sufficient time to complete their individual shutdown operations. Each VCX server attempts to confirm receipt of the shutdown command from the UPS. If the shutdown command is not received, a VCX server tries to resend the signal 3 times before proceeding to complete the shutdown. If signalling fails (for example, because of network connectivity issues during the shutdown sequence), the VCX server tries to send a trap. The server receives power (but in a halted state) until the UPS battery is exhausted and the UPS turns itself off.
Power Restoration	When power returns, each VCX server: ■ Boots and begins to provide service. ■ Generates a trap indicating system startup.
Power Restoration During Shutdown	If power is restored after a VCX server as begun final shutdown sequence, but before the shutdown has completed, the server completes the shutdown and signals the UPS to turn off. The UPS turns off, then back on automatically, and the server restarts.
Unable to Contact UPS	If a VCX server is configured for UPS monitoring but is unable to contact a configured UPS, a trap is generated to indicate that UPS monitoring is not occurring. The server continues to operate normally and periodically retries to contact the UPS. If the UPS subsequently becomes reachable, a trap is generated indicating that the error condition has been cleared.

9 Configuring the Call Processor

The VCX Call Processor provides call routing as well as other call services for the VCX IP Telephony Solution.

This chapter includes the following topics:

- Call Processor Overview
- Configuration Methods
- Configuring Trusted Endpoints
- Configuring Accounting and Directory Services

Call Processor Overview

The Call Processor handles both call processing and call routing and acts as a SIP back-to-back user agent. This means that the Call Processor actually serves as one active end point for each signaling leg of a call.

Call Processor Advantages

The Call Processor advantages are:

- Uses stateful routing — maintains information about a user's session.
- Designed for memory and performance utilization — recycles its own memory and keeps track of that memory so that any problems can be identified and fixed quickly.
- Built-in diagnostics — Can be accessed through the CLI to troubleshoot the system.
- Writes one CDR — The Call Processor writes only one CDR per call containing all information for that call, which makes the system more efficient.

Configuration Methods

Call Processor configuration is normally completed during the installation of VCX system software. However, you may need to reconfigure the Call Processor after the installation, for example, to add additional trusted end points if you add a branch office.

There are three recommended methods of configuring the Call Processor:

- Through the Enterprise Management Suite (EMS)

  EMS is an optional management tool that offers a simple method to configure the Call Processor. EMS uses an SNMP interface that allows for easy viewing and management of all of the Call Processor configurable parameters. See the *3Com Enterprise Management Suite User Guide* for basic EMS information and see the *Enterprise Management Suite User Guide for VCX V7000 Components* for VCX specific information.

- Using the **vcx-reconfigure** command

  The **vcx-reconfigure** command is run from a console attached to the VCX server. This command allows you to modify the configuration of an existing VCX system. This command is described in Chapter 7.

- Through the **remoteCli** Command Line Interpreter

  The **remoteCli** interface is run from a console attached to the VCX server. This command allows you to configure trusted end points (described in this chapter) and other VCX components (see Call Processor Command Line Interface Commands).

The Call Processor XML file (nmdb.xml) should not be modified manually since the Call Processor writes freely to the file at run-time and requires the Call Processor to be stopped in order to be edited. Use either CLI commands or the Enterprise Management Suite to configure the Call Processor instead.

Configuring Trusted Endpoints

This section provides information on how to add, edit, and delete trusted endpoints for a Call Processor. Trusted endpoints do not need to have a port specified. An IP address, if present in the trusted endpoint list, is trusted independently of the port.

To see the current list of trusted endpoints:

1. Log onto the server hosting the Call Processor.
2. Enter the following commands to start the remoteCli interface:

   ```
   cd /opt/3com/VCX/callprocessor/remoteCli/bin
   ./remoteCli -callprocessor
   ```

3. Enter the following command to list the trusted end points:

   ```
   show cctrusted
   ```

   Output from this command is similar to the following:

   ```
   CcTrusted
       -Index -RowStatus -TrustedAddress -Netmask
       1      1          10.230.64.5     255.255.255.255
       2      1          10.230.63.7     255.255.255.255
       3      1          10.230.63.15    255.255.255.255
       4      1                          255.255.255.255
   ```

Adding Trusted Endpoints

To add a trusted endpoint to a Call Processor using the CLI:

1. Log onto the server hosting the Call Processor.
2. Navigate to the */opt/3com/VCX/callprocessor/remoteCli/bin*.

3 Start the **remoteCLI** interface:

```
./remoteCli -callprocessor
```

4 Add either a single or range of trusted endpoints:

a To add a single trusted endpoint, from the prompt (>) enter:

```
config CcTrusted rowStatus=4 index=<index ID>
TrustedAddress=<IP address of endpoint>
```

b To add a range of trusted endpoints using abbreviated variables, at the prompt (>) enter:

```
config cct row=4 index=<index ID> trustedaddr=<IP address
of endpoint> netmask=<IP address of netmask>
```

See Table 12 for descriptions and values of the configurable parameters.

Table 12 CcTrusted Configurable Parameter Descriptions

Column Name	Description	When Takes Effect	Range	Default
rowStatus	This determines what sort of configuration you want to do with a trusted endpoint such as delete or add one. In order to configure a row you always need to specify the index.	Once Call Processor restarted.	1 = active 2 = not in service 3 = not ready 4 = add 5 = create and wait 6 = delete	1
index	This is the trusted endpoint table's key and is a unique identifier of a row.	Once Call Processor restarted.	1 through 128	1
TrustedAddress	Indicates an endpoint to trust. Each row is for an IP address and port combination. By default, if only the IP address is supplied, the default SIP IP Port 5060 is assumed. To specify the port, simply append a colon (:) to the IP address and add the port number.	Once Call Processor restarted.	**For IP Address:** dotted IP string NOTE: maximum 15 characters. **For Port Number:** 0 through 65535	**For IP Address:** 0.0.0.0 NOTE: must be configured. **For Port Number:** 5060
netmask	Used when you would like to add a range of trusted endpoints.	Once Call Processor restarted.	dotted IP string NOTE: maximum 15 characters.	0.0.0.0

5 To exit the Remote CLI application, enter:

```
exit
```

Editing Trusted Endpoints

To edit a trusted endpoint of a Call Processor using the CLI:

1. Log onto the server hosting the Call Processor.
2. Navigate to the */opt/3com/VCX/callprocessor/remoteCli/bin*.
3. Start the **remoteCLI** interface:

   ```
   ./remoteCli -callprocessor
   ```

4. At the **remoteCLI** prompt (>) enter:

   ```
   config CcTrusted RowStatus=<RowStatus variable> index=<index
   ID> TrustedAddress=<IP address of endpoint>
   ```

   See Table 12 for descriptions and values of the configurable parameters.

5. To exit the **remoteCLI** interface, enter:

   ```
   exit
   ```

Deleting Trusted Endpoints

To delete a trusted endpoint from the Call Processor using the **remoteCLI** interface:

1. Log onto the server hosting the Call Processor.
2. Navigate to the */opt/3com/VCX/callprocessor/remoteCli/bin*.
3. Start the **remoteCLI** interface:

   ```
   ./remoteCli -callprocessor
   ```

4. At the prompt (>) enter:

   ```
   config CcTrusted RowStatus=6 index=<index ID>
   TrustedAddress=<IP address of endpoint>
   ```

   See Table 12 for descriptions and values of the configurable parameters.

5. To exit the **remoteCLI** interface, enter:

   ```
   exit
   ```

Configuring Accounting and Directory Services

This section describes how to add and delete servers that provide Accounting services, and Authentication and Directory services.

Configuration of these services is normally completed during the installation of VCX system software. However, you can reconfigure Accounting services, and Authentication and Directory services after the installation.

CAUTION: *If you add one or both of these services using the method described in this section and later you run the* `vcx-reconfigure` *command, the list of services provided in* `vcx-reconfigure` *will override those defined using remoteCli. Furthermore, if you reconfigure your VCX system using remoteCli and subsequently upgrade the system to a newer release, the upgrade process will not recognize the remoteCli reconfiguration. You will have to manually reconfigure your system using remoteCli to match your previous configuration. Consult with your 3Com representative before using the remoteCli to configure Accounting services or Authentication and Directory services on your VCX system.*

Adding Primary and Secondary Accounting Servers

To add a primary Accounting server using the **remoteCLI** interface:

1. Log onto the server hosting the primary Call Processor.
2. Navigate to the */opt/3com/VCX/callprocessor/remoteCli/bin*.
3. Start the **remoteCLI** interface:

   ```
   ./remoteCli -callprocessor
   ```

4. At the **remoteCli** prompt (>) enter:

   ```
   config acctc use=false
   config accts pri=1 IpAddress=<IP address of primary
   Accounting server>
   config accts pri=1 LocalIpAddress=<IP address of call
   processor>
   config acctc use=true
   ```

5. The interface lists the IP address of the new Accounting server.
6. To exit the **remoteCLI** interface, enter:

   ```
   exit
   ```

To add a secondary Accounting server using the **remoteCLI** interface:

1. Log onto the server hosting the primary Call Processor.
2. Navigate to the */opt/3com/VCX/callprocessor/remoteCli/bin*.
3. Start the **remoteCLI** interface:

   ```
   ./remoteCli -callprocessor
   ```

4. At the **remoteCli** prompt (>) enter:

   ```
   config acctc use=false
   ```

```
config accts pri=2 IpAddress=<IP address of secondary
accounting server>
config accts pri=2 LocalIpAddress=<IP address of call
processor>
```

```
config acctc use=true
```

5 The interface lists the IP address of the new Accounting server.

6 To exit the **remoteCLI** interface, enter:

```
exit
```

Adding Primary and Secondary Authentication and Directory Servers

To add a primary Authentication and Directory Server using the **remoteCLI** interface:

1 Log onto the server hosting the primary Call Processor.

2 Navigate to the */opt/3com/VCX/callprocessor/remoteCli/bin*.

3 Start the **remoteCLI** interface:

```
./remoteCli -callprocessor
```

4 At the **remoteCli** prompt (>) enter:

```
config authc use=false
```

```
config auths pri=1 IpAddress=<IP address of primary
Authentication and Directory server>
config auths pri=1 LocalIpAddress=<IP address of call
processor>
```

```
config authc use=true
```

5 The interface lists the IP address of the new Authentication and Directory Server.

6 To exit the **remoteCLI** interface, enter:

```
exit
```

To add a secondary authentication server using the **remoteCLI** interface:

1 Log onto the server hosting the primary Call Processor.

2 Navigate to the */opt/3com/VCX/callprocessor/remoteCli/bin*.

3 Start the **remoteCLI** interface:

```
./remoteCli -callprocessor
```

4 At the **remoteCli** prompt (>) enter:

```
config authc use=false
```

```
config auths pri=2 IpAddress=<IP address of secondary
authentication server>
config auths pri=2 LocalIpAddress=<IP address of call
processor>
```

```
config authc use=true
```

5. The interface lists the IP address of the new Authentication and Directory Server.
6. To exit the **remoteCLI** interface, enter:

```
exit
```

10 Managing User Accounts Using the Command Line Interface

This chapter describes how to add, modify, and delete user accounts using the `user-MAC` command.

This chapter includes the following topics:

- Command Overview
- Using Single User Mode
- Using Batch Mode
- Files and Directories

Command Overview

The `user-MAC` command enables the automated creation of VCX user accounts and phone extension assignments. You can run the command in two modes:

- Single user mode — In this mode, the command adds one user account at a time based on the user attributes specified as command parameters. You can also use this mode to modify or delete a single user account.
- Batch mode — In this mode, the command adds multiple user accounts based on the user attributes specified in either a CSV or XML input file. You can also use this mode to modify or delete a multiple user accounts using an XML file (but not a CSV file) as input.

Using either single user mode or batch mode, you can specify the user account attributes shown in Table 13.

Table 13 User Account Attributes

Attribute	Description
User Name	Mandatory. Specifies the username associated with the account. The specified name must be unique[1]. This value is also required to change account attributes or to delete the account.
Password	Optional. Specifies the password the user enters to access the VCX User Provisioning interface. If omitted, uses the default password (changeme).
Title	Optional. Specifies an honorific (for example, Mr or Ms).
First Name	Optional. Specifies the user's first name.
Middle Name	Optional. Specifies the user's middle name.
Last Name	Optional. Specifies the user's last name.
Email	Optional. Specifies the user's e-mail address.
Street-1	Optional. Specifies the user's street address.
Street-2	Optional. Specifies the second part of the user's address (for example, an apartment number).
City	Optional. Specifies the user's city.
State/Province	Optional. Specifies the user's state or province.
Country	Optional. Specifies the user's country.
Zip	Optional. Specifies the user's zip code.

Table 13 User Account Attributes (continued)

Attribute	Description
Phone Address (extension)	Mandatory. Specifies the phone extension to be assigned to the user account. The specified number must be unique on the Call Processor.
Site Id	Optional. Specifies the site identifier assigned to the location hosting the account. This ID is specified during VCX software installation procedure.
Host Name	Optional. Specifies the IP address, in dotted decimal notation, of an Authentication and Directory server.
Phone Profile	Optional. Specifies the phone profile to be used by the account. All phones must be assigned a phone profile. If no profile is specified, the phone is assigned to the default phone profile.

1 When the add transaction executes, there can be no other user with the same name in the database.

You can create, modify, or delete user accounts on remote sites.

- To create, modify, or delete user accounts on a branch office from the regional office associated with the branch, you must use the Site Id attribute. Furthermore, the Authentication and Directory service on the target system must be available (a port must be open in the firewall on the branch).
- To create, modify, or delete user accounts on a remote office from a regional office, you must use the Site Id attribute *and* the Host Name attribute (specifying the IP address of the remote system). Furthermore, the Authentication and Directory service on the target system must be available (a port must be open in the firewall on the remote system).

To use the `user-MAC` command:

1. Log into the primary VCX server using the *cworks* account.
2. Enter the following command:

```
cd /opt/3com/VCX/vcxdata/bin
```

You can now enter the `user-MAC` command in either single user mode or batch mode. See the sections in this chapter for a description of each

mode, the required syntax, and examples. For online help with command syntax, enter the following command:

```
./user-MAC --verbose-help
```

When you execute the `user-MAC` command, console output indicates the progress of the requested action and provides a summary when finished.

Using Single User Mode

You can use the `user-MAC` command in single user mode to add modify, or delete one user account at a time.

In single user mode, the `user-MAC` command can take the parameters shown in Table 14

Table 14 user-MAC Command Parameters

Parameter (full name/abbreviation)	Takes Value?	Mode	Parameter Type	Description
--help or --h	No	Both	None	Returns text describing command usage.
--csv	Yes	Batch	CSV file	Indicates command input is a comma separated value (CSV) file. The parameter value specifies the name of the CSV file.
--debug or- -deb	Yes	Both	integer	For internal use.
--delete or --del	No	Single	None	Deletes the specified user account.
--mod or --mo	No	Single	None	Modifies the specified user account.
--non-stop or- -no	No	Batch	None	Indicates that command process in batch mode should not halt because of processing errors.
--xml	Yes	Batch	XML file	Indicates command input is an XML file. The parameter value specifies the name of the XML file.
--uname or --u	Yes	Single	String	Mandatory. The value specifies the username associated with the account. The specified name must be unique. This value is also required to change account attributes or to delete the account
--new-uname	Yes	Single	String	Used with the --mod parameter to change a username to the specified value.
--new-phone	Yes	Single	String	Used with the --mod parameter to change a user's phone extension to the specified value.

Table 14 user-MAC Command Parameters (continued)

Parameter (full name/abbreviation)	Takes Value?	Mode	Parameter Type	Description
--password or --pa	Yes	Single	String	The value specifies the password the user enters to access the VCX User Provisioning interface. To create the account with the default password (changeme), omit this field.
--title or --t	Yes	Single	String	The value specifies an honorific (for example, Mr or Ms).
--first	Yes	Single	String	The value specifies the user's first name.
--middle or --mi	Yes	Single	String	The value specifies the user's middle name.
--last or --l	Yes	Single	String	The value specifies the user's last name.
--email or --e	Yes	Single	String	The value specifies the user's e-mail address.
--street1	Yes	Single	String	The value specifies the user's street address.
--street2	Yes	Single	String	The value specifies the second part of the user's address (for example, an apartment number).
--city or --ci	Yes	Single	String	The value specifies the user's city.
--state	Yes	Single	String	The value specifies the user's state or province.
--country or --co	Yes	Single	String	The value specifies the user's country.
--zip or --z	Yes	Single	String	The value specifies the user's zip code.
--phone or --ph	Yes	Single	String	Mandatory. The value specifies the phone extension to be assigned to the user account. The specified number must be unique on the Call Processor.
--pprofile	Yes	Single	String	The value specifies the phone profile to be used by the account. All phones must be assigned a phone profile. To create the account with the default phone profile, omit this field.
--site-id	Yes	Single	String	The value specifies the site identifier assigned to the location hosting the account. This ID is specified during VCX software installation procedure.
--remote	Yes	Single	String	The value specifies the IP address, in dotted decimal notation, of a remote Authentication and Directory server.

Note the following syntax considerations:

- Full parameter and abbreviated parameter names must be prefaced with two hyphens (for example, `--password`).
- String parameter values that include spaces, punctuation, or special characters *must* be enclosed in double quotation marks. For example, the address 26 Granite Street must be entered as **`--street1 "26 Granite Street"`**. In general, it is advisable to avoid using characters such as:
  - ' and " (single double quotation marks
  - < or > (angle brackets)
  - ; (semicolon)
  - ? (question mark)
  - ! (exclamation mark
  - / or \ (slash marks)
- The `--password` parameter sets the password the user enters to access the VCX User Provisioning web interface. The user also must have a password to log in to the phone configured with the specified extension (`--phone` parameter value). By default, this phone password is 12345.

Command Modes

The `user-MAC` command operates in three modes:

- **Add** — This is the default mode. To add a new user account, you *must* enter the `user-MAC` command with the `--uname` and `--phone` parameters; all other parameters are optional.
- **Delete** — To delete a user account, you enter the `user-MAC` command with the `--delete` and `--uname` parameters.
- **Modify** — To modify a user account, you enter the `user-MAC` command with the `--modify` and `--uname` parameters, plus the parameters you want to change.

  If you want to change a user's phone extension, you must enter the `user-MAC` command with `--modify` plus the `--phone` parameter (specifying the existing phone extension) and the `--new-phone` parameter (specifying the new phone extension). The existing extension is required because the user may have more than one assigned phone extension.

If you want to change the account's username, you enter the `user-MAC` command with `--modify` plus the `--uname` parameter and the `--new-uname` parameter.

You cannot use the `user-MAC` command with the `--modify` to change the value of the `--site-id` parameter. However, the `--site-id` parameter is required in modify mode if you want to change account parameters for a user who is not located in the default site (the site on which you are logged in).

Single User Mode Command Syntax

This section describes the `user-MAC` command syntax for the add, modify, and delete modes. Optional parameters appear in brackets.

Single user **Add** mode uses the following command syntax:

```
user-MAC --uname User Name --phone Phone Number
[--password Password] [--title Title] [--first First Name]
[--middle Middle Name] [--last Last Name]
[--email Email Address] [--street1 Street Address1]
[--street2 Street Address2] [--city City Name]
[--stateprov State Or Province] [--country Country Name]
[--zip Zip Code] [--site-id Site Id]
[--remote Host IP Addr][--pprofile Phone Profile Name]
```

Single user **Delete** mode uses the following command syntax:

```
user-MAC --delete --uname User Name [--site-id Site Id]
[--remote Host IP Addr]
```

Single user **Modify** mode uses the following command syntax:

```
user-MAC --mod --uname User Name
[--new-uname New User Name][--password Password]
[--title Title] [--first First Name] [--middle Middle Name]
[--last Last Name] [--email Email Address]
[--street1 Street Address1] [--street2 Street Address2]
[--city City Name] [--state State Or Province]
[--country Country Name] [--zip Zip Code]
[--phone Old Phone Number] [--new-phone New Number]
[--site-id Site Id] [--remote Host IP Addr]
```

Single User Mode Examples

This section provides an example illustrating the `user-MAC` command syntax required to add, modify, and delete a user account in single user mode.

The following example adds a user account for jjohnson and assigns the user the phone extension 2314323. The account will be created on the branch office with the site ID Br3.

```
user-MAC --uname jjhonson --password 3dkaRiEI02
--title Mr --first Jack --middle Oliver --last Jhonson
--email jackj@dcah.com --street1 "2132 Rosecrans, suite 231"
--city Rochester --state NY --country USA --zip 14232
--phone 2314323 –pprofile local --site-id Br3
```

You could enter the same command using abbreviated parameter names:

```
user-MAC -u jjhonson -pa 3dkaRiEI02 -t Mr --first Jack
-mi Oliver -l Jhonson -e jackj@dcah.com
--street1 "2132 Rosecrans, suite 231" --ci Rochester
--state NY -co USA -z 14232 --ph 2314323 --pp local
--site-id Br3
```

The following simple command quickly adds a user account:

```
user-MAC --u jjhonson --ph 2314323
```

The following command deletes the user account for jjohnson:

```
user-MAC --delete --u jjhonson
```

The following command changes the phone extension for the jjohnson user account:

```
user-MAC --mod --u jjhonson --ph 5552121 --new-ph 5552222
```

Using Batch Mode

In batch mode, you create either a comma separated values (CSV) file or an XML file to use as input for `user-MAC` command processing. Each request (CSV line or XML transaction node) makes up a transaction.

- An XML file can contain a mixture of add, delete, and modify transactions.

  You cannot use a modify transaction to change the site ID of a user account. The site ID (`--site-id`) is required for a modify transaction if the account to be changed is located at a branch site. If the account is located on another region, the modify transaction must specify a site ID (`--site-id`) and remote IP address (`--remote`).

- A CSV file can contain add transactions only.

Batch mode processing can run in either stop mode (the default) or non-stop mode (the `user-MAC` command line includes the `--non-stop` qualifier). For both modes, during the initial parse, the input file is validated for format but not for content validity. If the parse encounters a formatting error (for example, an angle bracket (>) is missing in an XML file), processing stops.

- In stop mode, if an error is found after the initial parse is complete, processing stops.
- In non-stop mode, if an error is found after the initial parse is complete, the offending transaction is dumped, but processing continues to the next transaction in the file.

Console output provides a running indication of progress and an action summary on completion.

Command processing generates two log files, whose names and locations are displayed on your console. One file contains a summary of command actions. The second file contains debug information that is useful if processing fails. If the log files cannot be created, command processing halts. See Files and Directories for location information.

Managing User Accounts with an XML File

You can use an XML file as input to the `user-MAC` command. Transactions in the file can add, modify, or delete user accounts. 3Com Corporation recommends that an XML file contain no more than 5000 transactions. While this is not a hard limit, exceeding 5000 transactions may cause performance issues.

Use the following syntax to specify an XML file as input to the `user-MAC` command (and get the return code displayed on your console):

`./user-MAC --xml` *`InputFileName`*`.xml --non-stop; echo "RET:$?"`

The XML support files are located in the */opt/3com/VCX/vcxdata/conf* directory, and are described in subsequent sections.

XML Input File DTD

The DTD file that specifies XML format for `user-MAC` command input is named `user-MAC-transactions.dtd` and has the following structure:

```
<!ELEMENT user-MAC-transactions (transaction+) >
<!ELEMENT transaction (
      uname,
      phone?,
```

```
      newPhone?,
      newUname?,
      password?,
      title?,
      first?,
      middle?,
      last?,
      email?,
      street1?,
      street2?,
      city?,
      state?,
      country?,
      zip?,
      site?,
      remote?,
      pprofile?
)>
<!ATTLIST transaction type (mod | delete) #IMPLIED >
<!ELEMENT uname (#PCDATA) >
<!ELEMENT phone (#PCDATA) >
<!ELEMENT newPhone (#PCDATA) >
<!ELEMENT newUname (#PCDATA) >
<!ELEMENT password (#PCDATA) >
<!ELEMENT title (#PCDATA) >
<!ELEMENT first (#PCDATA) >
<!ELEMENT middle (#PCDATA) >
<!ELEMENT last (#PCDATA) >
<!ELEMENT email (#PCDATA) >
<!ELEMENT street1 (#PCDATA) >
<!ELEMENT street2 (#PCDATA) >
<!ELEMENT city (#PCDATA) >
<!ELEMENT state (#PCDATA) >
<!ELEMENT country (#PCDATA) >
<!ELEMENT zip (#PCDATA) >
<!ELEMENT site (#PCDATA) >
<!ELEMENT remote (#PCDATA) >
<!ELEMENT pprofile (#PCDATA) >
```

Sample XML Input File Format

The following sample XML input file is based on the DTD file shown in the previous section, XML Input File DTD. The sample shows one add transaction, one modify transaction, and one delete transaction.

```
<?xml version="1.0" encoding="utf-8"?>
<!DOCTYPE user-MAC-transactions >
```

```
<user-MAC-transactions>
   <transaction>
      <uname>value</uname>
      <phone>value</phone>
      <password>value</password>
      <title>value</title>
      <first>value</first>
      <middle>value</middle>
      <last>value</last>
      <email>value</email>
      <street1>value</street1>
      <street2>value</street2>
      <city>value</city>
      <state>value</state>
      <country>value</country>
      <zip>value</zip>
      <site>value</site>
      <remote>value</remote>
      <pprofile>value</pprofile>
   </transaction>

   <transaction type=”mod”>
      <uname>value</uname>
      <!--... whatever fields are to be changed ...-->
      <newUname>value</newUname>
      <newPhone>value</newPhone>
   </transaction>

   <transaction type=”delete”>
      <uname>value</uname>
   </transaction>
</user-MAC-transactions>
```

XML Default Values

Default values are supplied to `user-MAC` command processing in a default XML file, `user-MAC-defaults.xml`. The structure of this file is specified in the following DTD file, `user-MAC-defaults.dtd`:

```
<!ELEMENT user_MAC_defaults (
   password,
   phonepass,
   title,
   first,
   middle,
   last,
   email,
```

```
   street1,
   street2,
   city,
   state,
   country,
   zip,
   site,
   remote,
   pprofile
)>
<!ELEMENT password (#PCDATA) >
<!ELEMENT phonepass (#PCDATA) >
<!ELEMENT title (#PCDATA) >
<!ELEMENT first (#PCDATA) >
<!ELEMENT middle (#PCDATA) >
<!ELEMENT last (#PCDATA) >
<!ELEMENT email (#PCDATA) >
<!ELEMENT street1 (#PCDATA) >
<!ELEMENT street2 (#PCDATA) >
<!ELEMENT city (#PCDATA) >
<!ELEMENT state (#PCDATA) >
<!ELEMENT country (#PCDATA) >
<!ELEMENT zip (#PCDATA) >
<!ELEMENT site (#PCDATA) >
<!ELEMENT remote (#PCDATA) >
<!ELEMENT pprofile (#PCDATA) >
```

The default values are supplied to `user-MAC` command processing in a default XML file named `user-MAC-defaults.xml`, which specifies the following defaults:

```
<?xml version="1.0" encoding="utf-8"?>
<!DOCTYPE user_MAC_defaults >
<user_MAC_defaults>
   <!-- BLANK indicates that the field will be empty -->
   <!-- UNAME indicates that the field will contain the user
        name passed in to the transaction -->
   <password>changeme</password>
   <phonepass>12345</phonepass>
   <title>BLANK</title>
   <first>UNAME</first>
   <middle>BLANK</middle>
   <last>UNAME</last>
   <email>BLANK</email>
   <street1>Unknown</street1>
   <street2>BLANK</street2>
```

```
   <city>Unknown</city>
   <state>Unknown</state>
   <country>BLANK</country>
   <zip>00000</zip>
   <site>BLANK</site>
   <remote>BLANK</remote>
   <pprofile>BLANK</pprofile>
</user_MAC_defaults>
```

The default values specified in `user-MAC-defaults.xml` map to transaction values in your XML input file when the transaction value in your file is empty. The substituted parameter value depends on the parameter.

- For parameters such as `<zip>`, the default value specified in `user-MAC-defaults.xml` (`00000`) is used if your file does not specify a value.
- For parameters such as `<email>`, the default value specified in `user-MAC-defaults.xml` is `BLANK`. In these cases, if your file does not specify a value the value `BLANK` translates to a empty field.
- For the parameters `<first>` and `<last>`, the default value specified in `user-MAC-defaults.xml` is `UNAME`. In these two cases, if your file does not specify a value the value for `UNAME` is used.The value for `UNAME` is a mandatory, user-supplied value that specifies the name of the user account.
- The phone profile (`<pprofile>`) parameter value is the name string associated with a particular phone profile. When this parameter is set to blank in both the input XML and the default XML file, VCX software creates a default phone profile. This is not recommended. Ask your VCX administrator for the name of the default phone profile.

You can edit `user-MAC-defaults.xml` to change a default parameter value. For example, you could change the default value (`12345`) for `<phonepass>` to some other standard value (for example, `999`).

Adding User Accounts with a CSV File

You can use a comma separated value (CSV) file as input to the `user-MAC` command. Transactions in the file can add user accounts, but not modify or delete accounts. 3Com Corporation recommends that a CSV file contain no more than 5000 transactions. While this is not a hard limit, exceeding 5000 transactions may cause performance issues.

Use the following syntax to specify a CSV file as input to the `user-MAC` command:

```
./user-MAC --csv InputFileName.csv [--non-stop]
```

The CSV file *must* have the following column headings in the following order to be compatible with the `user-MAC` command line script:

UNAME,PHONE,PASSWORD,TITLE,FIRST,MIDDLE,LAST,EMAIL,
STREET1,STREET2,CITY,STATE,COUNTRY,ZIP,SITE,REMOTE,PPROFILE

The following CSV file adds two user accounts (note that omitted field values are represented by successive commas (,,) as for the MIDDLE parameter in the second entry):

UNAME,PHONE,PASSWORD,TITLE,FIRST,MIDDLE,LAST,EMAIL,STREET1,
STREET2,CITY,STATE,COUNTRY,ZIP,SITE,REMOTE,PPROFILE

jjohnson,1000,uhf672f,Ms,Jane,Sara,Johnson,jjohn@abc.com,
10 Oak St.,Apt 3,Boston,MA,USA,16003,reg1,10.231.22.30,local

mlopez,2000,kjhgs876jj,Mr,Miguel,,Lopez,mlopez@bcd.com,
231 E Main St,,Denver,CO,USA,30610,reg2,10.231.22.40,global

Files and Directories

Table 15 lists the files, and their locations, associated with the `user-MAC` command line script.

Table 15 File Locations

Directory	File	Description
/opt/3com/VCX/vcxdata/bin/		
	user-MAC	Runs the command line user account management script.
/opt/3com/VCX/vcxdata/conf/		
	user-MAC-transactions.dtd	This DTD file specifies the structure of XML input files required by the user-MAC command.
	user-MAC-transactions.xsl	This XSL file translates XML to HTML to improve readability of dumped XML.

Table 15 File Locations

Directory	File	Description
	user_MAC_defaults.dtd	This DTD file specifies the structure of the XML file that contains default values used by the user-MAC command script.
	user_MAC_defaults.xml	This XML file contains default values used by the user-MAC command script.
	user_MAC_defaults.xsl	This XSL file translates XML to HTML to improve readability of the default XML.
/opt/3com/components/vcxdata.<*version*>/bin/log		Contains various log files. The log files generated by execution of the user-MAC command include user-MAC and a timestamp in the filename, for example: `user-MAC_Thu_May_4_08:45:20_2006.log`

A Upgrading VCX Server Software From V7.0 to V7.1

This appendix describes the procedures required to upgrade a system running VCX server software version 7.0 to VCX server software version 7.1.

This appendix includes the following topics:

- Verifying Software Versions
- Overview of a 7.0 to 7.1 Upgrade
- Upgrading a Single-Site System With Two Servers
- Upgrading a Single-Site System With Four Servers
- Upgrading a Multi-Site System With No Branch Offices
- Upgrading a Multi-Site VCX System with Branch Offices

During a VCX system upgrade or downgrade, users cannot make calls within the system. However, users may be able to make emergency calls, or make calls to and receive calls from destinations outside of the VCX system (that is, the PSTN). This capability depends on the availability, configuration, and capacity of the media gateway (or gateways) set up in the VCX system. See the VCX Installation Guide *for information on configuring a failover call route point. Also refer to your gateway documentation.*

Verifying Software Versions

This section describes how to verify the software versions of individual components and entire releases.

Verifying Component Software Versions

To verify what the component software versions are:

1. Log onto the VCX system as *root*.
2. Navigate to */opt/3com/VCX/scripts*.
3. Enter this command:

   ./vcx-assemble --validate

   This lists all of the components and their software versions that comprise the current running assembly.

Verifying Release Software Version

For any version of VCX software, you can determine the release running on the system by following these steps:

1. Log onto the VCX system as *root*.
2. Enter the following commands:

   cd /opt/3com

   ls -l

   This command returns a list all of the installed releases and indicates the running VCX version. The running VCX version is preceded by a symbolic link icon (->).

```
lrwxrwxrwx 1 root root 21 Apr 26 09:13 VCX -> /opt/3com/VCX.7.0.7c
drwxr-xr-x   10 root root 4096 Mar 10 07:13 VCX.7.0.6c
```

In this example, the link points to version 7.0.7c. The other listed release, 7.0.6c, is installed, but not running.

For VCX systems running version 7.0 or higher, you can log in as *root* and enter the following command:

vcx-listversions

This command returns a list all of the installed releases and indicates the running VCX version.

```
7_0_10_11     2005-10-24    active
7_0_9_10      2005-10-18    installed
7_0_8_9       2005-10-10    installed
7_0_7_8       2005-09-20    installed
```

Overview of a 7.0 to 7.1 Upgrade

This section provides an overview of the procedures required to upgrade your VCX system, to an operational state, from version 7.0 to 7.1.

This appendix describes how to upgrade a VCX server by entering commands at a locally attached console. You can also upgrade a VCX server remotely by using 3Com Corporation's Enterprise Management Suite (EMS). EMS is an SNMP-based client/server application. Refer to the *Enterprise Management Suite User Guide for VCX V7000 Components* for information.

This section assumes the VCX system is successfully operating at version 7.0.7c before you perform the upgrade. If your system is running an earlier version of VCX 7.0 software (or VCX 6.0 software), you must upgrade to 7.0.7c before upgrading to version 7.1.

All components in a VCX system *must* run the same version of VCX software. This requirement has the following implications:

- You cannot upgrade or downgrade one component in a VCX system and not upgrade or downgrade the other system components.
- If you add a server to an existing VCX system (for example, a branch office), the VCX components on the new server must be installed with the same version of the VCX software as the existing components.

CAUTION: *3Com Corporation* strongly *recommends that you perform backups of your VCX system on a regular basis, for example, weekly. These backups should include provisioning database and voicemail database content.*

- *See* Chapter 5 *for information on backing up the provisioning data stored in the VCX Authentication and Directory server database.*
- *See the* IP Messaging Module Operations and System Administration Guide *for information on backing up voicemail and other IP Messaging data.*

In addition, BEFORE *you upgrade your VCX system to a new release, perform these backups again. If the upgrade fails and you must downgrade, you can restore data from these backups as part of the downgrade procedure.*

Preliminary Steps

Prior to performing any upgrade, you should check the following:

- Check the configuration type of the system you are going to upgrade. The upgrade procedure you need to perform depends on your VCX system configuration (see VCX Software Components and VCX Hardware Configurations). You can use the **`vcx-showconfigtype`** command to verify the configuration type. Your configuration determines the correct tar file (or files) required for the upgrade.
- You must stop database replication before starting the upgrade process. On replicated systems, check replication status to make sure it is normal. To check replication status, execute the following steps on the server hosting the Authentication and Directory services database:

  Log in using the *cworks* account.

  Enter: **`cd /opt/3com/VCX/vcxdata/bin`**

  Enter: **`./checkReplication`**

  The returned status should be *NORMAL*. If replication errors need to be cleared:

  Enter: **`./deleteReplicationErrors`**

CAUTION: *Do not attempt an upgrade if there are replication errors that cannot be deleted.*

CAUTION: *If you are upgrading a multi-site VCX system, you* must *ensure that phone extensions are unique throughout the system. In a VCX v7.0 multi-site system, it was possible to configure duplicate extensions in different regions. This included not only extensions assigned to a user but extensions assigned to hunt group, page groups, and call pickup groups. A VCX v7.1 multi-site system uses the Global Directory (which combines the local user directories on each region) to enable call routing between regions. See the* VCX Administration Guide*, version 7.1, for information on managing phone extensions.*

Post-Upgrade Considerations

In versions of VCX software prior to VCX v7.1, phone attributes (such as dial plan, ring tones, voicemail number) are configured for each phone extension. VCX v7.1 software includes a new feature called a phone profile.

A phone profile includes a set of attributes that are common to all phone extensions that are assigned to the profile.

The VCX v7.1 upgrade procedure creates one or more phone profiles based on data configured for phones in the VCX v7.0 system, and assigns each phone to the appropriate phone profile. However, the VCX administrator should be aware of upgrade implications on the following phone configuration settings:

- Registration Interval — This setting specifies how often a registration message is sent to the VCX server to see if it is active and to check for updates to the phone configuration. The VCX v7.1 upgrade procedure resets this parameter to the default value, 3600 seconds (one hour).
- Date Time Display Format, Local Time Zone, various Ring Tones, Call Fallback — The values for these settings are retained for individual phones. However, these same settings are also configured in the phone profile to which a phone is assigned. If the phone profile is modified and reapplied, the profile values will override the phone settings.

Refer to the *VCX Administration Guide* for more information on phone profiles and configuration options.

Configuration Upgrade Options

Depending on your configuration, you may need to upgrade the following VCX software components and configurations:

- IP Telephony and IP Messaging server software

  Supported on:

  - Single-site systems with two servers
  - Multi-site systems that include servers at regional offices, but no branch offices
  - Multi-site systems that include servers at regional offices and servers at branch offices that use local IP Messaging

- IP Telephony server software

  Supported on:

  - Single-site systems with four servers
  - Multi-site systems that include servers at regional offices and servers at branch offices that use global IP Messaging

- IP Messaging server software

  Supported on:

  - Single-site systems with four servers

- Multi-site systems that include servers at regional offices and servers at branch offices that use global or local IP Messaging
- A pair of Global Voicemail Central Servers (GVCS) to enable Global Voicemail Integration on an entire IP Messaging system

  A GVCS coordinates mailbox creation and mailbox updates on regional and branch office IP Messaging servers. The version 7.0 to version 7.1 upgrade procedure allows you to enable Global Voicemail Integration on servers running IP Messaging software. However, you *must* install IP Messaging software on a GVCS, and then set up the GVCS through the IP Messaging administrator configuration interface *before* enabling Global Voicemail Integration on regional and branch office IP Messaging servers. Refer to the *IP Messaging Module Operations and System Administration Guide* for more information and for configuration options.

- Call server software

  Supported on multi-site systems that include servers at regional offices with or without branch offices

- Call Records server software

  Supported on multi-site systems installed on a single server for regional offices with or without branch offices

- Authentication and Directory server software

  Supported on multi-site systems that include servers at regional offices with or without branch offices

You should upgrade each server from a locally attached console. The upgrade procedure includes a reboot of each upgraded server. If you perform an upgrade remotely (using a secure shell client, for example), you will be logged out when the reboot occurs. When you log back in, it may not be apparent that the upgrade has completed. If you enter commands before the upgrade has finished, the upgrade will fail.

Configuring New Features

VCX version 7.1 software includes the following three options:

- Adhoc Conferencing — Allows a server running the Call Processing service to act as a multi-caller (up to 6 callers) conferencing server.
- Global Voicemail Integration — Allows a server running the IP Messaging service to integrate its voicemail system with other

participating IP Messaging servers (see Configuration Upgrade Options).

- Uninterruptible Power Supply (UPS) Monitoring — Allows any server to be monitored by a UPS (see Chapter 8).

When you upgrade VCX version 7.0 software to version 7.1, prompts appear in the upgrade script that allow you to enable and configure these three options. If you decide not to enable an option during the upgrade to version 7.1, you enable and configure the option later by running the `vcx-reconfigure` command (see Chapter 7). For UPS Monitoring, you can also use the `vcx-ups-setup` command (see Chapter 8).

Upgrading a Single-Site System With Two Servers

Single-site VCX systems can have either two servers or four servers.

- In a two-server configuration, each server runs IP Telephony server software and IP Messaging server software.
- In a four-server configuration, one pair of servers runs IP Telephony server software; the second pair of servers runs IP Messaging server software.

Follow the procedure in this section to upgrade the two-server configuration at a single site from VCX version 7.0 software to VCX version 7.1 software.

Before you begin the upgrade procedures on the primary VCX server and on the secondary VCX server, perform these steps.:

1. Log in as *root* on the primary VCX server and on the secondary VCX server.
2. Stop the Tomcat process, first on the primary VCX server and then on the secondary VCX server by entering these commands:

```
cd /opt/3com/VCX/scripts/rc3.d
./S70tomcat stop
```

3. Ensure that database replication has no errors (see Preliminary Steps) and then drop replication on the primary VCX server by entering these commands:

```
cd /opt/3com/VCX/vcxdata/bin
su cworks
./dropReplication
```

The drop replication script starts. Follow these steps:

a The `Enter the VCX Site Identification i.e. Site Id` prompt appears.

Enter site ID configured for this system. For single-site systems, the site ID is identical for both the primary VCX server and the secondary VCX server.

b The `Enter the Number of MASTER SITEs other than the MASTER DEFINITION SITE` [1]: prompt appears.

Press *Enter* to accept the default.

c The `Enter the MASTER DEFINITION SITE IP Address [`*`IP address`*`]` prompt appears.

Enter the IP address of the Master Definition site or press *Enter* if the displayed address is correct. This is typically the IP address of the primary VCX server.

d The `Enter the MASTER SITE 1 IP Address [0.0.0.0]` prompt appears.

Enter the IP address of the Master Site. This is typically the IP address of the secondary VCX server.

e The `Do you want to continue with the above settings? [n/y]:` prompt appears.

Enter **`y`** to continue. The script executes.

4 Enter the following command to exit the *cworks* account and return to the *root* account:

```
exit
```

5 Stop IP Messaging, first on the primary VCX server and then on the secondary VCX server by entering these commands:

```
cd /opt/3com/VCX/scripts/rc3.d
./S60ums stop
```

6 Obtain a copy of the `vcx-all-7.1.`*`x`*`c.tar` software upgrade file and place it in the `/opt/installtemp` directory on the primary VCX server and on the secondary VCX server. The variable *x* indicates the version of VCX software (for example, `vcx-all-7.1.3c.tar`) that will replace the current version. The letter `c` is always appended to the version number.

Next, execute the following steps in the order listed:

- Upgrade the primary VCX server. See Upgrading the Primary VCX Server.

- Upgrade the secondary VCX server. See Upgrading the Secondary VCX Server.
- Set up database replication on the primary VCX server. See Set Up Database Replication.

Upgrading the Primary VCX Server

Follow the steps in this section to upgrade the primary VCX server.

1 To start the upgrade process, enter these commands on the primary VCX server:

```
cd /opt/installtemp
tar xvf vcx-all-7.1.xc.tar
cd upgrade-7.1.xc
./install-upgrade
```

The system may prompt you to confirm that a new operating system version will be installed and indicates which disk partition will be used after the upgrade. If you see such a prompt, answer **y.**

The system displays several status messages. The last two messages are:

```
------------------- Installation Completed Successfully -------------------
------------------- VCX version 7.1.xc is now available -------------------
```

2 Switch to the new software version by entering the following command:

```
vcx-switchversion 7.1.xc
```

The system displays several status messages and provides prompts that allow you enable Adhoc Conferencing, UPS Monitoring, and Global Voicemail Integration.

3 The Adhoc Conferencing prompt appears:

```
In order to support "ad-hoc" conferences with more than 3
participants, the Adhoc Conference Service is used.  This
service should be enabled on this server, unless another
server dedicated to Adhoc Conferencing will be used instead.
If available, a separate server typically provides greater
capacity and may be shared among sites.

Use the Adhoc service on this server? (Y/N) [Y]         :
```

If you want this server to act as a multi-caller (up to 6 callers) conferencing server, enter **y**. If not, enter **n**.

4 The UPS Monitoring prompt appears:

```
An Uninterruptible Power Supply (UPS) can be used with VCX
systems to avoid disruption due to a power outage.  VCX
provides a UPS monitoring service which tracks the UPS's
status and performs a safe shutdown when the its battery is
depleted during a long power outage.  To use this feature,
you must have a compatible UPS installed and configured in
accordance with the VCX documentation.

Enable UPS monitoring? [N]                                    :
```

If you do not have a UPS installed and enter **n** (or press *Enter*); the remaining UPS configuration prompts are not displayed.

If you do have a UPS installed and enter **y** and see Configuring UPS Monitoring for information on the subsequent UPS configuration prompts.

5 The Global Voicemail Integration prompt appears:

```
When multiple IP Messaging systems are in use, for example at
a region and one or more branches, the Global Voicemail
capability allows these systems to act as a single unified
voicemail system.  Say 'yes' here if this system participates
in Global Voicemail.

Is Global Voicemail enabled? [N]                              :
```

a If you have installed and configured (through the IP Messaging administrator configuration interface) a pair of Global Voicemail Central Servers (GVCS) to enable global voicemail integration, you can answer **y** to this prompt and go to step b. If not, enter **n** and go to step 6.

b The upgrade script asks if this server as a Global Voicemail Central Server:

```
In a Global Voicemail system, one site's IPMSG servers are
designated as the Central Servers and coordinate the
feature's operation.  Typically the Central Servers are at
one of the regional sites.

Is this a Central Server for Global Voicemail? [N]       :
```

If this server has been configured as a Global Voicemail Central Server, enter y and go to step 6.

If you answer **n** to indicate that this is not a Central Server, you will be prompted to enter the Central Server IP address.

6 After completing the Adhoc Conferencing, UPS Monitoring, and Global Voicemail Integration prompts, the server reboots. When the reboot process has been completed, the system starts VCX 7.1.*x* services.

After the system has completed the restart process, verify that the upgrade has occurred by entering this command:

```
ls -l /opt/3com/VCX
```

The symbolic link (VCX) should point to the new version of the VCX software (7.1.*x*c). If the link does not point to the new version, wait a few minutes and reenter the command. This could take several minutes and it is important the link pointer is correct before proceeding.

Example Output

```
/opt/3com/VCX -> /opt/3com/VCX.7.1.xc
```

7 Stop the Authentication and Directory service by entering the following commands:

```
cd /opt/3com/VCX/scripts/rc3.d
./S20vcxdata stop
```

Upgrading the Secondary VCX Server

Follow the steps in this section to upgrade the secondary VCX server.

1 To start the upgrade process, enter these commands on the secondary VCX server:

```
cd /opt/installtemp
tar xvf vcx-all-7.1.xc.tar
cd upgrade-7.1.xc
./install-upgrade
```

The system may prompt you to confirm that a new operating system version will be installed and indicates which disk partition will be used after the upgrade. If you see such a prompt, answer **y.**

The system displays several status messages. The last two messages are:

```
------------------- Installation Completed Successfully -------------------
------------------- VCX version 7.1.xc is now available -------------------
```

2 Switch to the new software version by entering the following command:

```
vcx-switchversion 7.1.xc
```

The system displays several status messages and provides prompts that allow you enable Adhoc Conferencing and UPS Monitoring.

3 The Adhoc Conferencing prompt appears:

```
In order to support "ad-hoc" conferences with more than 3
participants, the Adhoc Conference Service is used.  This
service should be enabled on this server, unless another
server dedicated to Adhoc Conferencing will be used instead.
If available, a separate server typically provides greater
capacity and may be shared among sites.

Use the Adhoc service on this server? (Y/N) [Y]          :
```

If you want this server to act as a multi-caller (up to 6 callers) conferencing server, enter **y**. If not, enter **n**.

4 The UPS Monitoring prompt appears:

```
An Uninterruptible Power Supply (UPS) can be used with VCX
systems to avoid disruption due to a power outage.  VCX
provides a UPS monitoring service which tracks the UPS's
status and performs a safe shutdown when the its battery is
depleted during a long power outage.  To use this feature,
you must have a compatible UPS installed and configured in
accordance with the VCX documentation.

Enable UPS monitoring? [N]                               :
```

If you do not have a UPS installed and enter **n** (or press *Enter*); the remaining UPS configuration prompts are not displayed.

If you do have a UPS installed and enter **y** and see Configuring UPS Monitoring for information on the subsequent UPS configuration prompts.

5 After completing the Adhoc Conferencing and UPS Monitoring prompts, the server reboots. When the reboot process has been completed, the system starts VCX 7.1.*x* services.

After the system has completed the restart process, verify that the upgrade has occurred by entering this command:

```
ls -l /opt/3com/VCX
```

The symbolic link (VCX) should point to the new version of the VCX software (7.1.*x*c). If the link does not point to the new version, wait a few minutes and reenter the command. This could take several minutes and it is important the link pointer is correct before proceeding.

Example Output

```
/opt/3com/VCX -> /opt/3com/VCX.7.1.xc
```

6 Stop the Authentication and Directory service by entering the following commands:

```
cd /opt/3com/VCX/scripts/rc3.d
./S20vcxdata stop
```

Set Up Database Replication

Follow the steps in this section to set up database replication.

1 Stop the Tomcat process, first on the primary VCX server and then on the secondary VCX server by entering these commands:

```
cd /opt/3com/VCX/scripts/rc3.d
./S70tomcat stop
```

2 Set up replication on the primary VCX server by entering these commands:

```
cd /opt/3com/VCX/vcxdata/bin
su cworks
./setupReplication
```

The replication setup script starts. Follow these steps:

a The `Enter the VCX Site Identification i.e. Site Id` prompt appears.

Enter site ID configured for this system. For single-site systems, the site ID is identical for both the primary VCX server and the secondary VCX server.

b The `Enter the Number of MASTER SITEs other than the MASTER DEFINITION SITE` [1]: prompt appears.

Press *Enter* to accept the default.

c The `Enter the MASTER DEFINITION SITE IP Address [`*`IP address`*`]` prompt appears.

Enter the IP address of the Master Definition site or press *Enter* if the displayed address is correct. This is typically the IP address of eth0 on the primary VCX server.

d The `Enter the MASTER SITE 1 IP Address [0.0.0.0]` prompt appears.

Enter the IP address of the Master Site. This is typically the IP address of eth0 on the secondary VCX server.

e The `Do you want to continue with the above settings? [n/y]:` prompt appears.

Enter **y** to continue. The script executes.

During script execution, messages appear describing the replication setup. Messages also appear stating that firewall setup should allow communication between the primary VCX server and the secondary VCX server. These messages are a reminder—firewall setup was performed during VCX software installation.

f The `Have you executed the ABOVE mentioned VCX-FIREWALL steps? [y/n]:` prompt appears.

Enter **y** to continue. The script executes.

When the replication is complete, *Multi-Master Replication Status* is reported as *NORMAL*. Do not continue to the next step until the replication is complete. Note that replication can take approximately 20 minutes to complete.

g You can check replication status by entering the following command:

```
./checkReplication
```

3 When the replication is complete and status is reported as *NORMAL*, enter the following command to exit the *cworks* account and return to the *root* account:

```
exit
```

4 Start the Authentication and Directory service on the primary VCX server and the secondary VCX server by entering the following commands:

```
cd /opt/3com/VCX/scripts/rc3.d
./S20vcxdata start
```

5 Start the Tomcat process on the primary VCX server and the secondary VCX server by entering the following command:

```
./S70tomcat start
```

Upgrading a Single-Site System With Four Servers

Single-site VCX systems can have either two servers or four servers.

- In a two-server configuration, each server runs IP Telephony server software and IP Messaging server software.
- In a four-server configuration, one pair of servers runs IP Telephony server software; the second pair of servers runs IP Messaging server software.

Follow the procedures in this section to upgrade the four-server configuration at a single site from VCX version 7.0 software to VCX version 7.1 software.

Before you begin the upgrade procedures on the four servers, perform these steps.:

1. Log in as *root* on the primary IP Telephony server and on the secondary IP Telephony server.
2. Stop the Tomcat process, first on the primary IP Telephony server and then on the secondary IP Telephony server by entering these commands:

   ```
   cd /opt/3com/VCX/scripts/rc3.d
   ./S70tomcat stop
   ```

3. Ensure that database replication has no errors (see Preliminary Steps) and then drop replication on the primary IP Telephony server by entering these commands:

   ```
   cd /opt/3com/VCX/vcxdata/bin
   su cworks
   ./dropReplication
   ```

   The drop replication script starts. Follow these steps:

   a. The `Enter the VCX Site Identification i.e. Site Id` prompt appears.

      Enter site ID configured for this system. For single-site systems, the site ID is identical for both the primary IP Telephony server and the secondary IP Telephony server.

   b. The `Enter the Number of MASTER SITEs other than the MASTER DEFINITION SITE` [1]: prompt appears.

      Press *Enter* to accept the default.

   c. The `Enter the MASTER DEFINITION SITE IP Address [`*`IP address`*`]` prompt appears.

      Enter the IP address of the Master Definition site or press *Enter* if the displayed address is correct. This is typically the IP address of eth0 on the primary VCX server.

   d. The `Enter the MASTER SITE 1 IP Address [0.0.0.0]` prompt appears.

      Enter the IP address of the Master Site. This is typically the IP address of eth0 on the secondary VCX server.

e The `Do you want to continue with the above settings? [n/y]:` prompt appears.

Enter **`y`** to continue. The script executes.

4 Enter the following command to exit the *cworks* account and return to the *root* account:

```
exit
```

5 Stop IP Messaging, first on the primary IP Messaging server and then on the secondary IP Messaging server by entering these commands:

```
cd /opt/3com/VCX/scripts/rc3.d
./S60ums stop
```

6 Obtain a copy of the `vcx-softswitch-7.1.xc.tar` software upgrade file and place it in the `/opt/installtemp` directory on the primary IP Telephony server and on the secondary IP Telephony server. The variable `x` indicates the version of VCX software (for example, `vcx-all-7.1.3c.tar`) that will replace the current version. The letter `c` is always appended to the version number.

7 Obtain a copy of the `vcx-ipmsg-7.1.xc.tar` software upgrade file and place it in the `/opt/installtemp` directory on the primary IP Messaging server and on the secondary IP Messaging server.

Next, execute the following steps in the order listed:

- Upgrade the primary IP Telephony server. See Upgrading the Primary IP Telephony Server.
- Upgrade the primary IP Messaging server. See Upgrading the Primary IP Messaging Server.
- Upgrade the secondary IP Telephony server. See Upgrading the Secondary IP Telephony Server.
- Upgrade the primary IP Messaging server. See Upgrading the Secondary IP Messaging Server.
- Set up database replication on the primary IP Telephony server. See Set Up Database Replication.

Upgrading the Primary IP Telephony Server

Follow the steps in this section to upgrade the primary IP Telephony server.

1 To start the upgrade process, enter these commands on the primary IP Telephony server:

```
cd /opt/installtemp
tar xvf vcx-softswitch-7.1.xc.tar
cd upgrade-7.1.xc
./install-upgrade
```

The system may prompt you to confirm that a new operating system version will be installed and indicates which disk partition will be used after the upgrade. If you see such a prompt, answer **y.**

The system displays several status messages. The last two messages are:

```
------------------- Installation Completed Successfully -------------------
------------------- VCX version 7.1.xc is now available -------------------
```

2 Switch to the new software version by entering the following command:

```
vcx-switchversion 7.1.xc
```

The system displays several status messages and provides prompts that allow you enable Adhoc Conferencing and UPS Monitoring.

3 The Adhoc Conferencing prompt appears:

```
In order to support "ad-hoc" conferences with more than 3
participants, the Adhoc Conference Service is used.  This
service should be enabled on this server, unless another
server dedicated to Adhoc Conferencing will be used instead.
If available, a separate server typically provides greater
capacity and may be shared among sites.

Use the Adhoc service on this server? (Y/N) [Y]          :
```

If you want this server to act as a multi-caller (up to 6 callers) conferencing server, enter **y**. If not, enter **n**.

4 The UPS Monitoring prompt appears:

```
An Uninterruptible Power Supply (UPS) can be used with VCX
systems to avoid disruption due to a power outage.  VCX
provides a UPS monitoring service which tracks the UPS's
status and performs a safe shutdown when the its battery is
depleted during a long power outage.  To use this feature,
you must have a compatible UPS installed and configured in
accordance with the VCX documentation.
```

```
Enable UPS monitoring? [N]                                    :
```

If you do not have a UPS installed and enter **n** (or press *Enter*); the remaining UPS configuration prompts are not displayed.

If you do have a UPS installed and enter **y** and see Configuring UPS Monitoring for information on the subsequent UPS configuration prompts.

5 After completing the Adhoc Conferencing and UPS Monitoring prompts, the server reboots. When the reboot process has been completed, the system starts VCX 7.1.*x* services.

6 After the system has completed the restart process, verify that the upgrade has occurred by entering this command:

```
ls -l /opt/3com/VCX
```

The symbolic link (VCX) should point to the new version of the VCX software (7.1.*xc*). If the link does not point to the new version, wait a few minutes and reenter the command. This could take several minutes and it is important the link pointer is correct before proceeding.

Example Output

```
/opt/3com/VCX -> /opt/3com/VCX.7.1.xc
```

7 Stop the Authentication and Directory service by entering the following commands:

```
cd /opt/3com/VCX/scripts/rc3.d
./S20vcxdata stop
```

Upgrading the Primary IP Messaging Server

Follow the steps in this section to upgrade the primary IP Messaging server.

1 To start the upgrade process, enter these commands on the primary IP Messaging server:

```
cd /opt/installtemp
tar xvf vcx-ipmsg-7.1.xc.tar
cd upgrade-7.1.xc
./install-upgrade
```

The system may prompt you to confirm that a new operating system version will be installed and indicates which disk partition will be used after the upgrade. If you see such a prompt, answer **y.**

The system displays several status messages. The last two messages are:

```
------------------- Installation Completed Successfully -------------------
------------------- VCX version 7.1.xc is now available -------------------
```

2 Switch to the new software version by entering the following command:

`vcx-switchversion 7.1.xc`

The system displays several status messages and provides prompts that allow you enable UPS Monitoring and Global Voicemail Integration.

3 The UPS Monitoring prompt appears:

```
An Uninterruptible Power Supply (UPS) can be used with VCX
systems to avoid disruption due to a power outage.  VCX
provides a UPS monitoring service which tracks the UPS's
status and performs a safe shutdown when the its battery is
depleted during a long power outage.  To use this feature,
you must have a compatible UPS installed and configured in
accordance with the VCX documentation.

Enable UPS monitoring? [N]                                    :
```

If you do not have a UPS installed and enter **`n`** (or press *Enter*); the remaining UPS configuration prompts are not displayed.

If you do have a UPS installed and enter **`y`** and see Configuring UPS Monitoring for information on the subsequent UPS configuration prompts.

4 The Global Voicemail Integration prompt appears:

```
When multiple IP Messaging systems are in use, for example at
a region and one or more branches, the Global Voicemail
capability allows these systems to act as a single unified
voicemail system.  Say 'yes' here if this system participates
in Global Voicemail.

Is Global Voicemail enabled? [N]                              :
```

a If you have installed and configured (through the IP Messaging administrator configuration interface) a pair of Global Voicemail Central Servers (GVCS) to enable global voicemail integration, you can answer **`y`** to this prompt and go to step b. If not, enter **`n`** and go to step 5.

b The upgrade script asks if this server as a Global Voicemail Central Server:

```
In a Global Voicemail system, one site's IPMSG servers are
designated as the Central Servers and coordinate the
```

```
feature's operation.  Typically the Central Servers are at
one of the regional sites.

Is this a Central Server for Global Voicemail? [N]      :
```

If this server has been configured as a Global Voicemail Central Server, enter y and go to step 5.

If you answer **n** to indicate that this is not a Central Server, you will be prompted to enter the Central Server IP address.

5 After completing the UPS Monitoring and Global Voicemail Integration prompts, the server reboots. When the reboot process has been completed, the system starts VCX 7.1.*x* services.

6 After the system has completed the restart process, verify that the upgrade has occurred by entering this command:

```
ls -l /opt/3com/VCX
```

The symbolic link (VCX) should point to the new version of the VCX software (7.1.*x*c). If the link does not point to the new version, wait a few minutes and reenter the command. This could take several minutes and it is important the link pointer is correct before proceeding.

Example Output

```
/opt/3com/VCX -> /opt/3com/VCX.7.1.xc
```

Upgrading the Secondary IP Telephony Server

Follow the steps in this section to upgrade the secondary IP Telephony server.

1 To start the upgrade process, enter these commands on the secondary IP Telephony server:

```
cd /opt/installtemp
tar xvf vcx-softswitch-7.1.xc.tar
cd upgrade-7.1.xc
./install-upgrade
```

The system may prompt you to confirm that a new operating system version will be installed and indicates which disk partition will be used after the upgrade. If you see such a prompt, answer **y.**

The system displays several status messages. The last two messages are:

```
------------------- Installation Completed Successfully -------------------
------------------- VCX version 7.1.xc is now available -------------------
```

2 Switch to the new software version by entering the following command:

`vcx-switchversion 7.1.xc`

The system displays several status messages and provides prompts that allow you enable Adhoc Conferencing and UPS Monitoring.

3 The Adhoc Conferencing prompt appears:

```
In order to support "ad-hoc" conferences with more than 3
participants, the Adhoc Conference Service is used.  This
service should be enabled on this server, unless another
server dedicated to Adhoc Conferencing will be used instead.
If available, a separate server typically provides greater
capacity and may be shared among sites.

Use the Adhoc service on this server? (Y/N) [Y]          :
```

If you want this server to act as a multi-caller (up to 6 callers) conferencing server, enter **`y`**. If not, enter **`n`**.

4 The UPS Monitoring prompt appears:

```
An Uninterruptible Power Supply (UPS) can be used with VCX
systems to avoid disruption due to a power outage.  VCX
provides a UPS monitoring service which tracks the UPS's
status and performs a safe shutdown when the its battery is
depleted during a long power outage.  To use this feature,
you must have a compatible UPS installed and configured in
accordance with the VCX documentation.

Enable UPS monitoring? [N]                               :
```

If you do not have a UPS installed and enter **`n`** (or press *Enter*); the remaining UPS configuration prompts are not displayed.

If you do have a UPS installed and enter **`y`** and see Configuring UPS Monitoring for information on the subsequent UPS configuration prompts.

5 After completing the Adhoc Conferencing and UPS Monitoring prompts, the server reboots. When the reboot process has been completed, the system starts VCX 7.1.*x* services.

6 After the system has completed the restart process, verify that the upgrade has occurred by entering this command:

`ls -l /opt/3com/VCX`

The symbolic link (VCX) should point to the new version of the VCX software (7.1.*x*c). If the link does not point to the new version, wait a few

minutes and reenter the command. This could take several minutes and it is important the link pointer is correct before proceeding.

Example Output

```
/opt/3com/VCX -> /opt/3com/VCX.7.1.xc
```

7 Stop the Authentication and Directory service by entering the following commands:

```
cd /opt/3com/VCX/scripts/rc3.d
./S20vcxdata stop
```

Upgrading the Secondary IP Messaging Server

Follow the steps in this section to upgrade the secondary IP Messaging server.

1 To start the upgrade process, enter these commands on the secondary IP Messaging server:

```
cd /opt/installtemp
tar xvf vcx-ipmsg-7.1.xc.tar
cd upgrade-7.1.xc
./install-upgrade
```

The system may prompt you to confirm that a new operating system version will be installed and indicates which disk partition will be used after the upgrade. If you see such a prompt, answer **y.**

The system displays several status messages. The last two messages are:

```
------------------- Installation Completed Successfully -------------------
------------------- VCX version 7.1.xc is now available -------------------
```

2 Switch to the new software version by entering the following command:

```
vcx-switchversion 7.1.xc
```

The system displays several status messages and provides prompts that allow you enable UPS Monitoring.

3 The UPS Monitoring prompt appears:

```
An Uninterruptible Power Supply (UPS) can be used with VCX
systems to avoid disruption due to a power outage.  VCX
provides a UPS monitoring service which tracks the UPS's
status and performs a safe shutdown when the its battery is
depleted during a long power outage.  To use this feature,
you must have a compatible UPS installed and configured in
accordance with the VCX documentation.

Enable UPS monitoring? [N]                                    :
```

If you do not have a UPS installed and enter **n** (or press *Enter*); the remaining UPS configuration prompts are not displayed.

If you do have a UPS installed and enter **y** and see Configuring UPS Monitoring for information on the subsequent UPS configuration prompts.

4 After completing the UPS Monitoring prompts, the server reboots. When the reboot process has been completed, the system starts VCX 7.1.*x* services.

5 After the system has completed the restart process, verify that the upgrade has occurred by entering this command:

```
ls -l /opt/3com/VCX
```

The symbolic link (VCX) should point to the new version of the VCX software (7.1.*xc*). If the link does not point to the new version, wait a few minutes and reenter the command. This could take several minutes and it is important the link pointer is correct before proceeding.

Example Output

```
/opt/3com/VCX -> /opt/3com/VCX.7.1.xc
```

Set Up Database Replication

Follow the steps in this section to set up database replication.

1 Stop the Tomcat process, first on the primary IP Telephony server and then on the secondary IP Telephony server by entering these commands (log in as *root*):

```
cd /opt/3com/VCX/scripts/rc3.d
./S70tomcat stop
```

2 Set up replication on the primary IP Telephony server by entering these commands:

```
cd /opt/3com/VCX/vcxdata/bin
su cworks
./setupReplication
```

The replication setup script starts. Follow these steps:

a The `Enter the VCX Site Identification i.e. Site Id` prompt appears.

Enter site ID configured for this system. For single-site systems, the site ID is identical for both the primary IP Telephony server and the secondary IP Telephony server.

b The `Enter the Number of MASTER SITEs other than the MASTER DEFINITION SITE [1]:` prompt appears.

Press *Enter* to accept the default.

c The `Enter the MASTER DEFINITION SITE IP Address [IP address]` prompt appears.

Enter the IP address of the Master Definition site or press *Enter* if the displayed address is correct. This is typically the IP address of eth0 on the primary VCX server.

d The `Enter the MASTER SITE 1 IP Address [0.0.0.0]` prompt appears.

Enter the IP address of the Master Site. This is typically the IP address of eth0 on the secondary VCX server.

e The `Do you want to continue with the above settings? [n/y]:` prompt appears.

Enter **`y`** to continue. The script executes.

During script execution, messages appear describing the replication setup. Messages also appear stating that firewall setup should allow communication between the primary IP Telephony server and the secondary IP Telephony server. These messages are a reminder—firewall setup was performed during VCX software installation.

f The `Have you executed the ABOVE mentioned VCX-FIREWALL steps? [y/n]:` prompt appears.

Enter **`y`** to continue. The script executes.

When the replication is complete, *Multi-Master Replication Status* is reported as *NORMAL*. Do not continue to the next step until the replication is complete. Note that replication can take approximately 20 minutes to complete.

g You can check the replication by entering the following command:

`./checkReplication`

3 When the replication is complete, enter the following command to exit the *cworks* account and return to the *root* account:

`exit`

4 Start the Authentication and Directory service on the primary IP Telephony server and the secondary IP Telephony server by entering the following commands:

```
cd /opt/3com/VCX/scripts/rc3.d
./S20vcxdata start
```

5 Start the Tomcat process on the primary IP Telephony server and the secondary IP Telephony server by entering the following command:

```
./S70tomcat start
```

Upgrading a Multi-Site System With No Branch Offices

Some VCX multi-site systems have regional offices but no branch offices. Each regional office contains a primary VCX server and a secondary VCX server. These servers perform call processing and IP Messaging tasks. One of the regional offices also contains a Call Records server which gathers call records from each of the regional offices.

- To upgrade the primary VCX server and the secondary VCX server, follow the instructions in Upgrading a Single-Site System With Two Servers earlier in this appendix.
- To upgrade the Call Records server, see the following section, Upgrading the Call Records Server.

Upgrading the Call Records Server

To upgrade the Call Records server:

1 Log in to the Call Records server as *root*.

2 Stop all VCX processes on the Call Records server by entering the following command:

```
cd /etc/init.d
./vcx stop
```

3 Obtain a copy of the `vcx-bss-7.1.xc.tar` software upgrade file and place it in the `/opt/installtemp` directory on the Call Records server.

4 Enter these commands:

```
cd /opt/installtemp
tar xvf vcx-bss-7.1.xc.tar
cd upgrade-7.1.xc
./install-upgrade
```

The system may prompt you to confirm that a new operating system version will be installed and indicates which disk partition will be used after the upgrade. If you see such a prompt, answer **y.**

The system displays several status messages. The last two messages are:

```
------------------- Installation Completed Successfully -------------------
------------------- VCX version 7.1.xc is now available -------------------
```

5 Change to the new software version by entering this command:

vcx-switchversion 7.1.xc

The system displays several status messages and provides prompts that allow you enable Adhoc Conferencing and UPS Monitoring.

6 The Adhoc Conferencing prompt appears:

```
In order to support "ad-hoc" conferences with more than 3
participants, the Adhoc Conference Service is used.  This
service should be enabled on this server, unless another
server dedicated to Adhoc Conferencing will be used instead.
If available, a separate server typically provides greater
capacity and may be shared among sites.

Use the Adhoc service on this server? (Y/N) [Y]          :
```

If you want this server to act as a multi-caller (up to 6 callers) conferencing server, enter **y**. If not, enter **n**.

7 The UPS Monitoring prompt appears:

```
An Uninterruptible Power Supply (UPS) can be used with VCX
systems to avoid disruption due to a power outage.  VCX
provides a UPS monitoring service which tracks the UPS's
status and performs a safe shutdown when the its battery is
depleted during a long power outage.  To use this feature,
you must have a compatible UPS installed and configured in
accordance with the VCX documentation.

Enable UPS monitoring? [N]                               :
```

If you do not have a UPS installed and enter **n** (or press *Enter*); the remaining UPS configuration prompts are not displayed.

If you do have a UPS installed and enter **y** and see Configuring UPS Monitoring for information on the subsequent UPS configuration prompts.

8 After completing the Adhoc Conferencing and UPS Monitoring prompts, the server reboots. When the reboot process has been completed, the system starts VCX 7.1.*x* services.

9 After the system has completed the restart process, verify that the upgrade has occurred by entering the following command:

```
ls -l /opt/3com/VCX
```

The symbolic link (VCX) should point to the new version of the VCX software (7.1.*x*c). If the link does not point to the new version, wait a few minutes and reenter the command. This could take several minutes and it is important the link pointer is correct before proceeding.

Example Output: `/opt/3com/VCX -> /opt/3com/VCX.7.1.xc`

Upgrading a Multi-Site VCX System with Branch Offices

Some multi-site VCX systems have regional offices and branch offices. Each branch office is associated with a regional office.

Multi-site VCX systems can be categorized by the method used to implement messaging.

- In a multi-site VCX system configured to use *local* messaging, the IP Messaging server is co-located with the IP Telephony server at each branch office. In this case, each branch office provides messaging services for its users.
- In a multi-site VCX system configured to use *global* messaging, the IP Messaging server is located on the regional office. Each branch office runs the IP Telephony server only. In this case, the regional office provides messaging services for users at each branch office.
- In version 7.1 multi-site VCX systems, you can configure branch and regional sites to use Global Voicemail Integration. Each location must be running IP Messaging services, which means that, in a multi-site system configured to use global messaging, you cannot enable Global Voicemail Integration on a branch. You can, however, enable Global Voicemail Integration on the region providing IP Messaging services to the branch.

  This service is provided by a pair of Global Voicemail Central Servers (GVCS) to enable global voicemail integration on an entire IP Messaging system.

  A GVCS coordinates mailbox creation and mailbox updates on regional and branch office IP Messaging servers. The version 7.1 upgrade procedure allows you to enable global voicemail integration on servers running IP Messaging software. However, you *must* install IP Messaging software on a GVCS, and then set up the GVCS through the IP Messaging administrator configuration interface *before* enabling global voicemail integration on regional and branch office IP Messaging servers. Refer to the *IP Messaging Module Operations and*

System Administration Guide for more information and for configuration options.

The components in a multi-site VCX system can be set up in many possible configurations. The procedures in this section are based on a multi-site VCX system that includes two regions (Region 1 and Region 2) with multiple branch offices in each region.

All upgrade commands are executed locally at the console.

When upgrading a region-to-region office configuration, you must drop replication between the Authentication and Directory server in each region.

***CAUTION**: When upgrading a multi-site VCX system, upgrade the regional servers before upgrading the branch servers. If you upgrade the branch servers first, the database schema on the branches may not match the schema version on the region causing database replication failure.*

Multi-Site VCX System Upgrade Order

When upgrading a multi-site VCX system configuration, upgrade the components in the following order:

- If you plan to enable Global Voicemail Integration, install IP Messaging software on a pair of Global Voicemail Central Servers, and then set up the GVCS through the IP Messaging administrator configuration interface *before* enabling global voicemail integration on regional and branch office IP Messaging servers.
- Upgrade the replicated Authentication and Directory servers in each regional office.
- Upgrade the IP Messaging servers in each regional office.
- Upgrade the Call servers in each regional office.
- Upgrade the Call Records server (optional).
- Upgrade the branch offices hosted by a region.

Upgrading the Regional Authentication and Directory Servers

This section describes how to upgrade the Authentication and Directory servers in Region 1 and Region 2.

In this example of two-region replication, replication is dropped on the Authentication and Directory server in each region. As the number of regions increases, so does the complexity of replication. The upgrade process for Authentication and Directory servers in a multi-region system

depends on how the servers have been installed and how replication has been set up.

To upgrade the Authentication and Directory server in Region 1:

1. Log in, as *root*, to the Call server in Region 1.
2. Stop the Tomcat process by entering the following commands:

   ```
   cd /opt/3com/VCX/scripts/rc3.d
   ./S70tomcat stop
   ```

3. Log in, as *root*, to the Authentication and Directory server in Region 1.
4. Ensure that database replication has no errors (see Preliminary Steps) and then drop replication by entering the following commands:

   ```
   cd /opt/3com/VCX/vcxdata/bin
   su cworks
   ./dropReplication
   ```

   The drop replication script starts. Follow these steps:

   a The `Enter the VCX Site Identification i.e. Site Id` prompt appears.

   Enter the site ID configured for Region 1.

   b The `Enter the Number of MASTER SITEs other than the MASTER DEFINITION SITE:` prompt appears.

   Enter the number of Master sites. To determine the number of Master sites associated with this server, use the *listVcxdata* command. See Manually Configuring Replication for an IP Telephony Server or IP Telephony and Messaging Server for more information. In this example, there is one Master site, Region 2.

   c The `Enter the MASTER DEFINITION SITE IP Address [`*`IP address`*`]` prompt appears.

   Enter the IP address of the Master Definition site. This is the IP address of the eth0 interface on this server (the Authentication and Directory server in Region 1).

   d The `Enter the MASTER SITE 1 IP Address [0.0.0.0]` prompt appears.

   Enter the IP address of the Master Site. This is the IP address of the eth0 interface on the Authentication and Directory server in Region 2. If there are more than one Master Sites, this question repeats until the number of master sites specified in step **b** is reached.

e The `Do you want to continue with the above settings? [n/y]:` prompt appears.

Enter **`y`** to continue. The script executes.

5 Enter the following command to exit the *cworks* account and return to the *root* account:

```
exit
```

6 Obtain a copy of the `vcx-dataserver-7.1.xc.tar` software upgrade file and place it in the `/opt/installtemp` directory on the Authentication and Directory server. The variable *x* indicates the version of VCX software (for example, `vcx-all-7.0.3c.tar`) that will replace the current version. The letter `c` is always appended to the version number.

7 Enter these commands:

```
cd /opt/installtemp
tar xvf vcx-dataserver-7.1.xc.tar
cd upgrade-7.1.x
./install-upgrade
```

The system may prompt you to confirm that a new operating system version will be installed and indicates which disk partition will be used after the upgrade. If you see such a prompt, answer **y.**

The system displays several status messages. The last two messages are:

```
------------------- Installation Completed Successfully -------------------
------------------- VCX version 7.1.xc is now available -------------------
```

8 Change to the new software version by entering this command:

```
vcx-switchversion 7.1.xc
```

The system displays several status messages and provides prompts that allow you enable UPS Monitoring.

9 The UPS Monitoring prompt appears:

```
An Uninterruptible Power Supply (UPS) can be used with VCX
systems to avoid disruption due to a power outage.  VCX
provides a UPS monitoring service which tracks the UPS's
status and performs a safe shutdown when the its battery is
depleted during a long power outage.  To use this feature,
you must have a compatible UPS installed and configured in
accordance with the VCX documentation.

Enable UPS monitoring? [N]                                :
```

If you do not have a UPS installed and enter **n** (or press *Enter*); the remaining UPS configuration prompts are not displayed.

If you do have a UPS installed and enter **y** and see Configuring UPS Monitoring for information on the subsequent UPS configuration prompts.

10 After completing the UPS Monitoring prompts, the server reboots. When the reboot process has been completed, the system starts VCX 7.1.*x* services.

After the system has completed the restart process, verify that the upgrade has occurred by entering the following command:

```
ls -l /opt/3com/VCX
```

The symbolic link (VCX) should point to the new version of the VCX software (7.1.*xc*). If the link does not point to the new version, wait a few minutes and reenter the command. This could take several minutes and it is important the link pointer is correct before proceeding.

Example Output: `/opt/3com/VCX -> /opt/3com/VCX.7.1.xc`

11 Enter the following commands to stop the Authentication and Directory server on Region 1:

```
cd /opt/3com/VCX/scripts/rc3.d
./S20vcxdata stop
```

To upgrade the Authentication and Directory server in Region 2:

1 Log in, as *root*, to the Call server in Region 2.

2 Stop the Tomcat process by entering the following commands:

```
cd /opt/3com/VCX/scripts/rc3.d
./S70tomcat stop
```

3 Log in, as *root*, to the Authentication and Directory server in Region 2.

4 Ensure that database replication has no errors (see Preliminary Steps) and then drop replication by entering the following commands:

```
cd /opt/3com/VCX/vcxdata/bin
su cworks
./dropReplication
```

The drop replication script starts. Follow these steps:

a The `Enter the VCX Site Identification i.e. Site Id` prompt appears.

Enter the site ID configured for Region 2.

b The `Enter the Number of MASTER SITEs other than the MASTER DEFINITION SITE:` prompt appears.

Enter the number of Master sites. To determine the number of Master sites associated with this server, use the *listVcxdata* command. See Manually Configuring Replication for an IP Telephony Server or IP Telephony and Messaging Server for more information. In this example, there is one Master site, Region 1.

c The `Enter the MASTER DEFINITION SITE IP Address [IP address]` prompt appears.

Enter the IP address of the Master Definition site. This is the IP address of the eth0 interface on this server (the Authentication and Directory server in Region 2).

d The `Enter the MASTER SITE 1 IP Address [0.0.0.0]` prompt appears.

Enter the IP address of the Master Site. This is the IP address of the eth0 interface on the Authentication and Directory server in Region 1. If there are more than one Master Sites, this question repeats until the number of master sites specified in step **b** is reached.

e The `Do you want to continue with the above settings? [n/y]:` prompt appears.

Enter **`y`** to continue. The script executes.

5 Enter the following command to exit the *cworks* account and return to the *root* account:

```
exit
```

6 Obtain a copy of the `vcx-dataserver-7.1.xc.tar` software upgrade file and place it in the `/opt/installtemp` directory on the Authentication and Directory server. The variable *x* indicates the version of VCX software (for example, `vcx-all-7.0.3c.tar`) that will replace the current version. The letter `c` is always appended to the version number.

7 Enter these commands:

```
cd /opt/installtemp
tar xvf vcx-dataserver-7.1.xc.tar
cd upgrade-7.1.x
./install-upgrade
```

The system may prompt you to confirm that a new operating system version will be installed and indicates which disk partition will be used after the upgrade. If you see such a prompt, answer **y.**

The system displays several status messages. The last two messages are:

```
------------------- Installation Completed Successfully -------------------
------------------- VCX version 7.1.xc is now available -------------------
```

8 Change to the new software version by entering this command:

`vcx-switchversion 7.1.xc`

The system displays several status messages and provides prompts that allow you enable UPS Monitoring.

9 The UPS Monitoring prompt appears:

```
An Uninterruptible Power Supply (UPS) can be used with VCX
systems to avoid disruption due to a power outage.  VCX
provides a UPS monitoring service which tracks the UPS's
status and performs a safe shutdown when the its battery is
depleted during a long power outage.  To use this feature,
you must have a compatible UPS installed and configured in
accordance with the VCX documentation.

Enable UPS monitoring? [N]                                    :
```

If you do not have a UPS installed and enter **`n`** (or press *Enter*); the remaining UPS configuration prompts are not displayed.

If you do have a UPS installed and enter **`y`** and see Configuring UPS Monitoring for information on the subsequent UPS configuration prompts.

10 After completing the UPS Monitoring prompts, the server reboots. When the reboot process has been completed, the system starts VCX 7.1.*x* services.

After the system has completed the restart process, verify that the upgrade has occurred by entering the following command:

`ls -l /opt/3com/VCX`

The symbolic link (VCX) should point to the new version of the VCX software (7.1.*xc*). If the link does not point to the new version, wait a few minutes and reenter the command. This could take several minutes and it is important the link pointer is correct before presiding.

Example Output: `/opt/3com/VCX -> /opt/3com/VCX.7.1.xc`

11 Enter the following commands to stop the Authentication and Directory server on Region 2:

```
cd /opt/3com/VCX/scripts/rc3.d
./S20vcxdata stop
```

At this point, you have upgraded the Authentication and Directory server on Region 1 and Region 2, and you have stopped database replication in both regions. The following steps upgrade the databases in each region, set up replication in each region, and restart the Authentication and Directory server in each region. You should still be logged in, as *root*, in each region.

1. On the Authentication and Directory server in Region 1, upgrade the replica on the Region 2 database by entering the following commands:

   ```
   su - cworks
   cd /opt/3com/VCX/vcxdata/bin
   ./upgradeVcxdata
   ```

   The `Enter the VCX Site Identification i.e. Site Id:` prompt appears.

2. Enter the Site ID for Region 2.

3. On the Authentication and Directory server in Region 2, upgrade the replica of the Region 1 database by entering the following commands:

   ```
   su - cworks
   cd /opt/3com/VCX/vcxdata/bin
   ./upgradeVcxdata
   ```

   The `Enter the VCX Site Identification i.e. Site Id:` prompt appears.

4. Enter the Site ID for Region 1.

5. Set up database replication on Region 1 by entering the following commands (you should still be logged in to the Authentication and Directory server as *cworks*):

   ```
   cd /opt/3com/VCX/vcxdata/bin
   ./setupReplication
   ```

   The replication setup script starts. Follow these steps:

   a. The `Enter the VCX Site Identification i.e. Site Id` prompt appears.

      Enter site ID configured for Region 1.

   b. The `Enter the Number of MASTER SITEs other than the MASTER DEFINITION SITE:` prompt appears.

      Enter the number of Master sites. To determine the number of Master Sites associated with this office, use the *listVcxdata* command. See Manually Configuring Replication for an IP Telephony Server or IP

Telephony and Messaging Server for more information. In this example, there is one Master site, Region 2.

c The `Enter the MASTER DEFINITION SITE IP Address [IP address]` prompt appears.

Enter the IP address of the Master Definition site. This is the IP address of the eth0 interface on this server (the Authentication and Directory server in Region 1).

d The `Enter the MASTER SITE 1 IP Address [0.0.0.0]` prompt appears.

Enter the IP address of the Master Site. This is the IP address of the eth0 interface on the Authentication and Directory server in Region 2. If there are more than one Master Sites, this question repeats until the number of master sites specified in step **b** is reached.

e The `Do you want to continue with the above settings? [n/y]:` prompt appears.

Enter **`y`** to continue. The script executes.

When the replication is complete, *Multi-Master Replication Status* is reported as *NORMAL*. Do not continue to the next step on this server until the replication is complete. Note that replication can take approximately 20 minutes to complete.

f You can check the replication by entering the following command:

```
./checkReplication
```

6 Set up database replication on Region 2 by entering the following commands (you should still be logged in to the Authentication and Directory server as *cworks*):

```
cd /opt/3com/VCX/vcxdata/bin
./setupReplication
```

The replication setup script starts. Follow these steps:

a The `Enter the VCX Site Identification i.e. Site Id` prompt appears.

Enter site ID configured for Region 2.

b The `Enter the Number of MASTER SITEs other than the MASTER DEFINITION SITE:` prompt appears.

Enter the number of Master sites. To determine the number of Master Sites associated with this office, use the *listVcxdata* command. See Manually Configuring Replication for an IP Telephony Server or IP

Telephony and Messaging Server for more information. In this example, there is one Master site, Region 1.

c The `Enter the MASTER DEFINITION SITE IP Address [IP address]` prompt appears.

Enter the IP address of the Master Definition site. This is the IP address of the eth0 interface on this server (the Authentication and Directory server in Region 2).

d The `Enter the MASTER SITE 1 IP Address [0.0.0.0]` prompt appears.

Enter the IP address of the Master Site. This is the IP address of the eth0 interface on the Authentication and Directory server in Region 1. If there are more than one Master Sites, this question repeats until the number of master sites specified in step **b** is reached.

e The `Do you want to continue with the above settings? [n/y]:` prompt appears.

Enter **`y`** to continue. The script executes.

When the replication is complete, *Multi-Master Replication Status* is reported as *NORMAL*. Do not continue to the next step on this server until the replication is complete. Note that replication can take approximately 20 minutes to complete.

f You can check the replication by entering the following command:

```
./checkReplication
```

7 Once replication is complete and status is *NORMAL* on Region 1 and Region 2, start the Authentication and Directory servers in each region by entering the following commands while logged in as *root*:

```
cd /opt/3com/VCX/scripts/rc3.d
./S20vcxdata start
```

8 Start the Tomcat process on the primary Call server and the secondary Call server in each region by entering the following commands:

```
cd /opt/3com/VCX/scripts/rc3.d
./S70tomcat start
```

Upgrading the Regional IP Messaging Servers

This section describes how to upgrade regional IP Messaging servers. These servers may provide messaging services for users using one of the following methods:

- Global Voicemail Integration — In version 7.1, multi-site VCX systems can be configured to use Global Voicemail Integration. This service is

provided by a pair of Global Voicemail Central Servers (GVCS) to enable global voicemail integration on an entire IP Messaging system. See Upgrading a Multi-Site VCX System with Branch Offices and the IP Messaging documentation.

- Local messaging — Messaging services are provided to remote users by the regional office.
- Global messaging — Messaging services are provided to users locally, by the either a regional office or a branch office.

For local and global messaging, you need to perform the steps in this section on a console attached to each IP Messaging server in all regions (Region 1 and Region 2 in this example).

For Global Voicemail Integration, the Global Voicemail Central Servers (GVCS) must be installed, and then configured through the IP Messaging administrator configuration interface *before* enabling global voicemail integration on regional and branch office IP Messaging servers. Refer to the *IP Messaging Module Operations and System Administration Guide* for more information and for configuration options. This section assumes that a pair of Global Voicemail Central Servers are available.

IP Messaging servers are typically configured in pairs, with one server acting as the primary and the other acting as the secondary. The primary IP Messaging server and a secondary IP Messaging server may be located in the same region or in different regions.

To upgrade IP Messaging servers running version 7.0 software:

1. Stop the primary IP Messaging server and a secondary IP Messaging server by entering the following commands, as *root*, on each server:

```
cd /opt/3com/VCX/scripts/rc3.d
./S60ums stop
```

2. Obtain a copy of the `vcx-ipmsg-7.1.xc.tar` software upgrade file and place it in the `/opt/installtemp` directory on the primary IP Messaging server and on the secondary IP Messaging server.
3. Start the upgrade process on the primary IP Messaging server by entering the following commands:

```
cd /opt/installtemp
tar xvf vcx-ipmsg-7.1.xc.tar
cd upgrade-7.1.xc
./install-upgrade
```

The system may prompt you to confirm that a new operating system version will be installed and indicates which disk partition will be used after the upgrade. If you see such a prompt, answer **y.**

The system displays several status messages. The last two messages are:

```
------------------- Installation Completed Successfully -------------------
------------------- VCX version 7.1.xc is now available -------------------
```

4 Switch to the new software version by entering the following command:

`vcx-switchversion 7.1.xc`

The system displays several status messages and provides prompts that allow you enable UPS Monitoring and Global Voicemail Integration.

5 The UPS Monitoring prompt appears:

```
An Uninterruptible Power Supply (UPS) can be used with VCX
systems to avoid disruption due to a power outage.  VCX
provides a UPS monitoring service which tracks the UPS's
status and performs a safe shutdown when the its battery is
depleted during a long power outage.  To use this feature,
you must have a compatible UPS installed and configured in
accordance with the VCX documentation.

Enable UPS monitoring? [N]                                    :
```

If you do not have a UPS installed and enter **`n`** (or press *Enter*); the remaining UPS configuration prompts are not displayed.

If you do have a UPS installed and enter **`y`** and see Configuring UPS Monitoring for information on the subsequent UPS configuration prompts.

6 The Global Voicemail Integration prompt appears:

```
When multiple IP Messaging systems are in use, for example at
a region and one or more branches, the Global Voicemail
capability allows these systems to act as a single unified
voicemail system.  Say 'yes' here if this system participates
in Global Voicemail.

Is Global Voicemail enabled? [N]                              :
```

a If you have installed and configured (through the IP Messaging administrator configuration interface) a pair of Global Voicemail Central Servers (GVCS) to enable global voicemail integration, you can answer **`y`** to this prompt and go to step b. If not, enter **`n`** and go to step 7.

b The upgrade script asks if this server as a Global Voicemail Central Server:

```
In a Global Voicemail system, one site's IPMSG servers are
designated as the Central Servers and coordinate the
feature's operation.  Typically the Central Servers are at
one of the regional sites.

Is this a Central Server for Global Voicemail? [N]      :
```

If this server has been configured as a Global Voicemail Central Server, enter y and go to step 7.

If you answer **n** to indicate that this is not a Central Server, you will be prompted to enter the Central Server IP address.

7 After completing the Adhoc Conferencing, UPS Monitoring, and Global Voicemail Integration prompts, the server reboots. When the reboot process has been completed, the system starts VCX 7.1.*x* services.

After the system has completed the restart process, verify that the upgrade has occurred by entering this command:

```
ls -l /opt/3com/VCX
```

The symbolic link (VCX) should point to the new version of the VCX software (7.1.*x*c). If the link does not point to the new version, wait a few minutes and reenter the command. This could take several minutes and it is important the link pointer is correct before proceeding.

Example Output

```
/opt/3com/VCX -> /opt/3com/VCX.7.1.xc
```

8 Upgrade the secondary IP Messaging server by following the procedure described in steps 3 through 7. Note that the Global Voicemail Integration prompt (step 6) does not appear for a secondary IP Messaging server upgrade.

Upgrading the Regional Call Servers

This section describes how to upgrade regional Call servers. Call servers are typically installed in redundant pairs (primary and secondary) in a multi-site VCX system. You need to perform the steps in this section on a console attached to each Call server in all regions (Region 1 and Region 2 in this example).

To upgrade the Call servers:

1. Log on, as *root*, to the primary Call server and the secondary Call server in a region.
2. Obtain a copy of the `vcx-callserver-7.1.xc.tar` software upgrade file and place it in the `/opt/installtemp` directory on the primary Call server and on the secondary Call server.
3. Start the upgrade process on the primary Call server by entering the following commands:

   ```
   cd /opt/installtemp
   tar xvf vcx-callserver-7.1.xc.tar
   cd upgrade-7.1.xc
   ./install-upgrade
   ```

   The system may prompt you to confirm that a new operating system version will be installed and indicates which disk partition will be used after the upgrade. If you see such a prompt, answer **y.**

   The system displays several status messages. The last two messages are:

```
------------------- Installation Completed Successfully -------------------
------------------- VCX version 7.1.xc is now available -------------------
```

4. Switch to the new software version by entering the following command:

   ```
   vcx-switchversion 7.1.xc
   ```

   The system displays several status messages and provides prompts that allow you enable Adhoc Conferencing and UPS Monitoring.

5. The Adhoc Conferencing prompt appears:

   ```
   In order to support "ad-hoc" conferences with more than 3
   participants, the Adhoc Conference Service is used.  This
   service should be enabled on this server, unless another
   server dedicated to Adhoc Conferencing will be used instead.
   If available, a separate server typically provides greater
   capacity and may be shared among sites.

   Use the Adhoc service on this server? (Y/N) [Y]          :
   ```

   If you want this server to act as a multi-caller (up to 6 callers) conferencing server, enter **`y`**. If not, enter **`n`**.

6. The UPS Monitoring prompt appears:

   ```
   An Uninterruptible Power Supply (UPS) can be used with VCX
   systems to avoid disruption due to a power outage.  VCX
   provides a UPS monitoring service which tracks the UPS's
   ```

```
status and performs a safe shutdown when the its battery is
depleted during a long power outage.  To use this feature,
you must have a compatible UPS installed and configured in
accordance with the VCX documentation.

Enable UPS monitoring? [N]                                  :
```

If you do not have a UPS installed and enter **n** (or press *Enter*); the remaining UPS configuration prompts are not displayed.

If you do have a UPS installed and enter **y** and see Configuring UPS Monitoring for information on the subsequent UPS configuration prompts.

7 After completing the Adhoc Conferencing and UPS Monitoring prompts, the server reboots. When the reboot process has been completed, the system starts VCX 7.1.*x* services.

After the system has completed the restart process, verify that the upgrade has occurred by entering this command:

`ls -l /opt/3com/VCX`

The symbolic link (VCX) should point to the new version of the VCX software (7.1.*xc*). If the link does not point to the new version, wait a few minutes and reenter the command. This could take several minutes and it is important the link pointer is correct before proceeding.

Example Output

```
/opt/3com/VCX -> /opt/3com/VCX.7.1.xc
```

8 Upgrade the secondary Call server by following steps 3 through 7.

Upgrading the Regional Call Records Server

This section describes how to upgrade regional the Call Records server. In a multi-site VCX system, a single Call server typically supports all regional offices. You need to perform the steps in this section on a console attached to the regional Call server.

To upgrade the Call Records server:

1 Log in to the Call Records server as *root*.

2 Obtain a copy of the `vcx-bss-7.1.xc.tar` software upgrade file and place it in the `/opt/installtemp` directory on the Call Records server.

3 Enter these commands:

```
cd /opt/installtemp
tar xvf vcx-bss-7.1.xc.tar
cd upgrade-7.1.xc
./install-upgrade
```

The system may prompt you to confirm that a new operating system version will be installed and indicates which disk partition will be used after the upgrade. If you see such a prompt, answer **y.**

The system displays several status messages. The last two messages are:

```
------------------- Installation Completed Successfully -------------------
------------------- VCX version 7.1.xc is now available -------------------
```

4 Change to the new software version by entering this command:

```
vcx-switchversion 7.1.xc
```

The system displays several status messages and provides prompts that allow you enable UPS Monitoring.

5 The UPS Monitoring prompt appears:

```
An Uninterruptible Power Supply (UPS) can be used with VCX
systems to avoid disruption due to a power outage.  VCX
provides a UPS monitoring service which tracks the UPS's
status and performs a safe shutdown when the its battery is
depleted during a long power outage.  To use this feature,
you must have a compatible UPS installed and configured in
accordance with the VCX documentation.

Enable UPS monitoring? [N]                                    :
```

If you do not have a UPS installed and enter **n** (or press *Enter*); the remaining UPS configuration prompts are not displayed.

If you do have a UPS installed and enter **y** and see Configuring UPS Monitoring for information on the subsequent UPS configuration prompts.

6 After completing the UPS Monitoring prompts, the server reboots. When the reboot process has been completed, the system starts VCX 7.1.*x* services.

After the system has completed the restart process, verify that the upgrade has occurred by entering the following command:

```
ls -l /opt/3com/VCX
```

The symbolic link (VCX) should point to the new version of the VCX software (7.1.*xc*). If the link does not point to the new version, wait a few

minutes and reenter the command. This could take several minutes and it is important the link pointer is correct before proceeding.

Example Output: `/opt/3com/VCX -> /opt/3com/VCX.7.1.xc`

Upgrading Branch Offices

This section describes how to upgrade branch offices. Each branch office is associated with a regional office.

As noted in Upgrading a Multi-Site VCX System with Branch Offices, multi-site VCX systems can be categorized by the method used to implement messaging: global messaging, local messaging, or Global Voicemail Integration.

The procedures in this section are based on a multi-site VCX system that includes two regions (Region 1 and Region 2). For this example system, the branches in Region 1 use local messaging, and the branches in Region 2 use global messaging.

- A branch that implements local messaging runs IP Telephony and IP Messaging server software. Because this type of branch office includes IP Messaging services, you can enable Global Voicemail Integration on the branch.
- A branch that implements global messaging runs IP Telephony server software. The IP Messaging server software running on a regional server provides messaging services for the branch. Because this type of branch office receives its IP Messaging services from a regional IP Messaging server, you cannot enable Global Voicemail Integration on the branch. In this case, you must enable Global Voicemail Integration on the regional server.

All upgrade commands are executed locally at the console.

***CAUTION**: When upgrading a multi-site VCX system, upgrade the regional servers before upgrading the branch servers. If you upgrade the branch servers first, the database schema on the branches may not match the schema version on the region causing database replication failure.*

To upgrade the branch offices in Region 1 (local messaging):

1. Log in to the first branch office server as *root*.
2. Obtain a copy of the `vcx-all-7.1.xc.tar` software upgrade file and place it in the `/opt/installtemp` directory on the branch office server. The variable *x* indicates the version of VCX software (for example,

vcx-all-7.1.3c.tar) that will replace the current version. The letter c is always appended to the version number.

3 To start the upgrade process, enter the following commands:

```
cd /opt/installtemp
tar xvf vcx-all-7.1.xc.tar
cd upgrade-7.1.xc
./install-upgrade
```

The system may prompt you to confirm that a new operating system version will be installed and indicates which disk partition will be used after the upgrade. If you see such a prompt, answer **y.**

The system displays several status messages. The last two messages are:

```
------------------- Installation Completed Successfully -------------------
------------------- VCX version 7.1.xc is now available -------------------
```

4 Switch to the new software version by entering the following command:

```
vcx-switchversion 7.1.xc
```

The system displays several status messages and provides prompts that allow you enable Adhoc Conferencing, UPS Monitoring, and Global Voicemail Integration.

5 The Adhoc Conferencing prompt appears:

```
In order to support "ad-hoc" conferences with more than 3
participants, the Adhoc Conference Service is used.  This
service should be enabled on this server, unless another
server dedicated to Adhoc Conferencing will be used instead.
If available, a separate server typically provides greater
capacity and may be shared among sites.

Use the Adhoc service on this server? (Y/N) [Y]          :
```

If you want this server to act as a multi-caller (up to 6 callers) conferencing server, enter **y**. If not, enter **n**.

6 The UPS Monitoring prompt appears:

```
An Uninterruptible Power Supply (UPS) can be used with VCX
systems to avoid disruption due to a power outage.  VCX
provides a UPS monitoring service which tracks the UPS's
status and performs a safe shutdown when the its battery is
depleted during a long power outage.  To use this feature,
you must have a compatible UPS installed and configured in
accordance with the VCX documentation.

Enable UPS monitoring? [N]                               :
```

If you do not have a UPS installed and enter **n** (or press *Enter*); the remaining UPS configuration prompts are not displayed.

If you do have a UPS installed and enter **y** and see Configuring UPS Monitoring for information on the subsequent UPS configuration prompts.

7 The Global Voicemail Integration prompt appears:

```
When multiple IP Messaging systems are in use, for example at
a region and one or more branches, the Global Voicemail
capability allows these systems to act as a single unified
voicemail system.  Say 'yes' here if this system participates
in Global Voicemail.

Is Global Voicemail enabled? [N]                              :
```

a If you have installed and configured (through the IP Messaging administrator configuration interface) a pair of Global Voicemail Central Servers (GVCS) to enable global voicemail integration, you can answer **y** to this prompt and go to step b. If not, enter **n** and go to step 8.

b The upgrade script asks if this server as a Global Voicemail Central Server:

```
In a Global Voicemail system, one site's IPMSG servers are
designated as the Central Servers and coordinate the
feature's operation.  Typically the Central Servers are at
one of the regional sites.

Is this a Central Server for Global Voicemail? [N]      :
```

If this server has been configured as a Global Voicemail Central Server, enter y and go to step 8.

If you answer **n** to indicate that this is not a Central Server, you will be prompted to enter the Central Server IP address.

8 After completing the Adhoc Conferencing, UPS Monitoring, and Global Voicemail Integration prompts, the server reboots. When the reboot process has been completed, the system starts VCX 7.1.*x* services.

After the system has completed the restart process, verify that the upgrade has occurred by entering this command:

```
ls -l /opt/3com/VCX
```

The symbolic link (VCX) should point to the new version of the VCX software (7.1.*x*c). If the link does not point to the new version, wait a few

minutes and reenter the command. This could take several minutes and it is important the link pointer is correct before proceeding.

Example Output

```
/opt/3com/VCX -> /opt/3com/VCX.7.1.xc
```

9 Repeat steps 1 through 8 for all the other branch office servers in Region 1.

To upgrade the branch offices in Region 2 (global messaging):

1 Log in to the first branch office server as *root*.

2 Obtain a copy of the `vcx-softswitch-7.1.xc.tar` software upgrade file and place it in the `/opt/installtemp` directory on the branch office server. The variable *y* indicates the version of VCX software (for example, `vcx-all-7.1.3c.tar)` that will replace the current version. The letter `c` is always appended to the version number.

3 To start the upgrade process, enter the following commands:

```
cd /opt/installtemp
tar xvf vcx-softswitch-7.1.xc.tar
cd upgrade-7.1.xc
./install-upgrade
```

The system may prompt you to confirm that a new operating system version will be installed and indicates which disk partition will be used after the upgrade. If you see such a prompt, answer **y.**

The system displays several status messages. The last two messages are:

```
------------------- Installation Completed Successfully -------------------
------------------- VCX version 7.1.xc is now available -------------------
```

4 Switch to the new software version by entering the following command:

```
vcx-switchversion 7.1.xc
```

The system displays several status messages and provides prompts that allow you enable Adhoc Conferencing and UPS Monitoring.

5 The Adhoc Conferencing prompt appears:

```
In order to support "ad-hoc" conferences with more than 3
participants, the Adhoc Conference Service is used.  This
service should be enabled on this server, unless another
server dedicated to Adhoc Conferencing will be used instead.
If available, a separate server typically provides greater
capacity and may be shared among sites.
```

```
Use the Adhoc service on this server? (Y/N) [Y]          :
```

If you want this server to act as a multi-caller (up to 6 callers) conferencing server, enter **y**. If not, enter **n**.

6 The UPS Monitoring prompt appears:

```
An Uninterruptible Power Supply (UPS) can be used with VCX
systems to avoid disruption due to a power outage.  VCX
provides a UPS monitoring service which tracks the UPS's
status and performs a safe shutdown when the its battery is
depleted during a long power outage.  To use this feature,
you must have a compatible UPS installed and configured in
accordance with the VCX documentation.

Enable UPS monitoring? [N]                               :
```

If you do not have a UPS installed and enter **n** (or press *Enter*); the remaining UPS configuration prompts are not displayed.

If you do have a UPS installed and enter **y** and see Configuring UPS Monitoring for information on the subsequent UPS configuration prompts.

7 After completing the Adhoc Conferencing and UPS Monitoring prompts, the server reboots. When the reboot process has been completed, the system starts VCX 7.1.*x* services.

8 After the system has completed the restart process, verify that the upgrade has occurred by entering this command:

```
ls -l /opt/3com/VCX
```

The symbolic link (VCX) should point to the new version of the VCX software (7.1.*x*c). If the link does not point to the new version, wait a few minutes and reenter the command. This could take several minutes and it is important the link pointer is correct before proceeding.

Example Output

```
/opt/3com/VCX -> /opt/3com/VCX.7.1.xc
```

9 Repeat steps 1 through 8 for all the other branch office servers in Region 2.

Configuring UPS Monitoring

During the upgrade of a VCX server, you are asked if you want to enable UPS monitoring. UPS monitoring can also be enabled after you upgrade to VCX version 7.1 software. See Chapter 8, especially Adding UPS Support to an Existing VCX System, or more information on UPS monitoring.

This section assumes you have answered **y** to the following prompt during an upgrade to VCX version 7.1 software:

```
An Uninterruptible Power Supply (UPS) can be used with VCX
systems to avoid disruption due to a power outage.  VCX
provides a UPS monitoring service which tracks the UPS's
status and performs a safe shutdown when the its battery is
depleted during a long power outage.  To use this feature,
you must have a compatible UPS installed and configured in
accordance with the VCX documentation.

Enable UPS monitoring? [N] : y
```

To complete UPS monitoring configuration on a VCX server:

1. The upgrade script asks if this server will be powered by multiple Uninterruptible Power Supplies:

   ```
   It is possible to use multiple UPS units to power a single
   server if the server has redundant power supplies with
   separate power connections.

   Will multiple UPS's power this server? [N] :
   ```

   If this server has redundant power supplies each with its own UPS, enter **y**. If this server uses a single UPS, enter **n** (or press *Enter*).

2. The upgrade script asks if you want to configure this server as the master:

   ```
   A single UPS can power one or more VCX systems.  A UPS
   'Master' communicates directly with a UPS, while a 'Slave'
   communicates with the Master to get UPS status.  Only one
   'Master' system should monitor a given UPS.  If this VCX
   system is the only one connected to the UPS, say 'Y' here.
   Note: a VCX system's UPS Monitoring role is independent of
   any other role it may have within a VCX deployment.

   Do you want this server to be the master ? [N] :
   ```

   If you answer **n** to indicate that this server is a slave (not the master), you are prompted to enter the IP address of the master. Enter the IP address of the master to complete UPS monitoring configuration for this server.

   If you answer **y** to indicate that this server is the master, continue to step 3.

3. The upgrade script prompts you for the IP address of the UPS:

```
UPS Monitoring requires a network-enabled UPS.  Enter the IP
address assigned to the UPS's management card or Ethernet
interface.  Note: The UPS must already be configured with
this address.

UPS IP address :
```

Enter the IP address assigned to the UPS.

4 The upgrade script prompts you for the SNMP write community string assigned to the UPS:

```
The SNMP 'write' community string configured in the UPS is
required.  (For security reasons, it is recommended that the
default value provided by the UPS be changed.)

UPS 'write' community string :
```

The string you enter here must match the SNMP write community string configured on the UPS.

5 If you answered yes in step 1 (indicating multiple UPS devices), the upgrade script prompts you for the IP address of the second UPS:

```
Enter the IP address assigned to the second UPS's management
card or Ethernet interface.  Note: The UPS must already be
configured with this address.

Second UPS IP address :
```

6 The upgrade script prompts you for the SNMP write community string assigned to the second UPS:

```
The SNMP 'write' community string configured in the second
UPS is required.

Second UPS 'write' community string :
```

The string you enter here must match the SNMP write community string configured on the UPS.

7 The upgrade script prompts you for the battery charge level (expressed as a percentage of battery capacity) at which point the attached server (or servers) should initiate a shutdown:

```
A 'low battery' condition is reached when the battery charge
reaches a defined threshold percentage.

Low Battery Threshold (%)                              : 25
```

Enter the UPS battery threshold charge. The default is 25%. The range is from 25% to 75%.

8 The upgrade script gives you the opportunity to change your UPS monitoring configuration:

```
Do you wish to change any of the UPS Monitoring parameters?
[N] :
```

Enter **n** (or press Enter) to accept the current configuration. Enter **y** if you want to change one or more parameter values.

B Upgrading VCX Server Software From V7.1.x to V7.1.y

This appendix describes the procedures required to upgrade a system running VCX server software version 7.1.*x* to VCX server software version 7.1.*y*.

This appendix includes the following topics:

- Verifying Software Versions
- Overview of a 7.1.x to 7.1.y Upgrade
- Upgrading a Single-Site System With Two Servers
- Upgrading a Single-Site System With Four Servers
- Upgrading a Multi-Site System With No Branch Offices
- Upgrading a Multi-Site VCX System with Branch Offices

During a VCX system upgrade or downgrade, users cannot make calls within the system. However, users may be able to make emergency calls, or make calls to and receive calls from destinations outside of the VCX system (that is, the PSTN). This capability depends on the availability, configuration, and capacity of the media gateway (or gateways) set up in the VCX system. See the VCX Installation Guide *for information on configuring a fail-over call route point. Also refer to your gateway documentation.*

Verifying Software Versions

This section describes how to verify the software versions of individual components and entire releases.

Verifying Component Software Versions

To verify what the component software versions are:

1. Log onto the VCX system as *root*.
2. Navigate to */opt/3com/VCX/scripts*.
3. Enter this command:

   `./vcx-assemble --validate`

   This lists all of the components and their software versions that comprise the current running assembly.

Verifying Release Software Version

For any version of VCX software, you can determine the release running on the system by following these steps:

1. Log onto the VCX system as *root*.
2. Enter the following commands:

   `cd /opt/3com`

   `ls -l`

   This command returns a list all of the installed releases and indicates the running VCX version. The running VCX version is preceded by a symbolic link icon (->).

```
lrwxrwxrwx 1 root root 21 May 12 09:13 VCX -> /opt/3com/VCX.7.1.1c
drwxr-xr-x   10 root root 4096 May 10 07:13 VCX.7.1.0c
```

   In this example, the link points to version 7.1.1c. The other listed release, 7.1.0c, is installed, but not running.

   For VCX systems running version 7.0 or higher, you can log in as *root* and enter the following command:

   `vcx-listversions`

   This command returns a list all of the installed releases and indicates the running VCX version.

```
7_1_10_11     2006-04-20    active
7_1_9_10      2006-04-13    installed
7_1_8_9       2006-04-06    installed
7_1_7_8       2006-04-01    installed
```

Overview of a 7.1.*x* to 7.1.*y* Upgrade

This section provides an overview of the procedures required to upgrade your VCX system from one version of VCX software (7.1.*x*) to a later version (7.1.*y*). These procedures upgrade the VCX system to an operational state. This section assumes the VCX system is successfully operating at version 7.1.*x* before you perform the upgrade.

This appendix describes how to upgrade a VCX server by entering commands at a locally attached console. You can also upgrade a VCX server remotely by using 3Com Corporation's Enterprise Management Suite (EMS). EMS is an SNMP-based client/server application. Refer to the *Enterprise Management Suite User Guide for VCX V7000 Components* for information.

All components in a VCX system *must* run the same version of VCX software. This requirement has the following implications:

- You cannot upgrade or downgrade one component in a VCX system and not upgrade or downgrade the other system components.
- If you add a server to an existing VCX system (for example, a branch office), the VCX components on the new server must be installed with the same version of the VCX software as the existing components.

CAUTION: *3Com Corporation* strongly *recommends that you perform backups of your VCX system on a regular basis, for example, weekly. These backups should include provisioning database and voicemail database content.*

- *See* Chapter 5 *for information on backing up the provisioning data stored in the VCX Authentication and Directory server database.*
- *See the* IP Messaging Module Operations and System Administration Guide *for information on backing up voicemail and other IP Messaging data.*
- *Also regularly back up the VCX configuration data on each VCX server. (See* Chapter 4*.)*

In addition, BEFORE *you upgrade your VCX system to a new release, perform these backups again. If the upgrade fails and you must downgrade, you can restore data from these backups as part of the downgrade procedure.*

Preliminary Steps

Prior to performing any upgrade, you should check the following:

- Check the configuration type of the system you are going to upgrade. The upgrade procedure you need to perform depends on your VCX system configuration (see VCX Software Components and VCX Hardware Configurations). You can use the **`vcx-showconfigtype`** command to verify the configuration type. Your configuration determines the correct tar file (or files) required for the upgrade.
- You must stop database replication before starting the upgrade process. On replicated systems, check replication status to make sure it is normal. To check replication status, execute the following steps on the server hosting the Authentication and Directory services database:

  Log in using the *cworks* account.

  Enter: **`cd /opt/3com/VCX/vcxdata/bin`**

  Enter: **`./checkReplication`**

  The returned status should be *NORMAL*. If replication errors need to be cleared:

  Enter: **`./deleteReplicationErrors`**

  CAUTION: *Do not attempt an upgrade if there are replication errors that cannot be deleted.*

  Depending on your configuration, you may need to upgrade the following VCX software components and configurations:

  - IP Telephony and IP Messaging server software

    Supported on:

    - Single-site systems with two servers
    - Multi-site systems that include servers at regional offices, but no branch offices
    - Multi-site systems that include servers at regional offices and servers at branch offices that use local IP Messaging
  - IP Telephony server software

    Supported on:

    - Single-site systems with four servers
    - Multi-site systems that include servers at regional offices and servers at branch offices that use global IP Messaging
  - IP Messaging server software

Supported on:

- Single-site systems with four servers
- Multi-site systems that include servers at regional offices and servers at branch offices that use global or local IP Messaging
- A pair of Global Voicemail Central Servers (GVCS) to enable Global Voicemail Integration on an entire IP Messaging system

  A GVCS coordinates mailbox creation and mailbox updates on regional and branch office IP Messaging servers. If you want to enable Global Voicemail Integration on a 7.1 system, you must install IP Messaging software on a GVCS, and then set up the GVCS through the IP Messaging administrator configuration interface. Next, run `vcx-reconfigure` (see Chapter 7) on regional and branch office IP Messaging servers to enable Global Voicemail Integration. Refer to the *IP Messaging Module Operations and System Administration Guide* for more information and for configuration options.

- Call server software

  Supported on multi-site systems that include servers at regional offices with or without branch offices

- Call Records server software

  Supported on multi-site systems installed on a single server for regional offices with or without branch offices

- Authentication and Directory server software

  Supported on multi-site systems that include servers at regional offices with or without branch offices

You should upgrade each server from a locally attached console. The upgrade procedure includes a reboot of each upgraded server. If you perform an upgrade remotely (using a secure shell client, for example), you will be logged out when the reboot occurs. When you log back in, it may not be apparent that the upgrade has completed. If you enter commands before the upgrade has finished, the upgrade will fail.

Upgrading a Single-Site System With Two Servers

Single-site VCX systems can have either two servers or four servers.

- In a two-server configuration, each server runs IP Telephony server software and IP Messaging server software.

- In a four-server configuration, one pair of servers runs IP Telephony server software; the second pair of servers runs IP Messaging server software.

Follow the procedure in this section to upgrade the two-server configuration, at a single site, from one version of VCX software (7.1.*x*) to a later version (7.1.*y*).

Before you begin the upgrade procedures on the primary VCX server and on the secondary VCX server, perform these steps.:

1. Log in as *root* on the primary VCX server and on the secondary VCX server.
2. Stop the Tomcat process, first on the primary VCX server and then on the secondary VCX server by entering these commands:

```
cd /opt/3com/VCX/scripts/rc3.d
./S70tomcat stop
```

3. Ensure that database replication has no errors (see Preliminary Steps) and then drop replication on the primary VCX server by entering these commands:

```
cd /opt/3com/VCX/vcxdata/bin
su cworks
./dropReplication
```

The drop replication script starts. Follow these steps:

a The `Enter the VCX Site Identification i.e. Site Id` prompt appears.

Enter site ID configured for this system. For single-site systems, the site ID is identical for both the primary VCX server and the secondary VCX server.

b The `Enter the Number of MASTER SITEs other than the MASTER DEFINITION SITE` [1]: prompt appears.

Press *Enter* to accept the default.

c The `Enter the MASTER DEFINITION SITE IP Address [`*`IP address`*`]` prompt appears.

Enter the IP address of the Master Definition site or press *Enter* if the displayed address is correct. This is typically the IP address of the primary VCX server.

d The `Enter the MASTER SITE 1 IP Address [0.0.0.0]` prompt appears.

Enter the IP address of the Master Site. This is typically the IP address of the secondary VCX server.

e The `Do you want to continue with the above settings? [n/y]:` prompt appears.

Enter **`y`** to continue. The script executes.

4 Enter the following command to exit the *cworks* account and return to the *root* account:

```
exit
```

5 Stop IP Messaging, first on the primary VCX server and then on the secondary VCX server by entering these commands:

```
cd /opt/3com/VCX/scripts/rc3.d
./S60ums stop
```

6 Obtain a copy of the `vcx-all-7.1.yc.tar` software upgrade file and place it in the `/opt/installtemp` directory on the primary VCX server and on the secondary VCX server. The variable *`y`* indicates the version of VCX software (for example, `vcx-all-7.0.3c.tar`) that will replace the current version. The letter `c` is always appended to the version number.

Next, execute the following steps in the order listed:

- Upgrade the primary VCX server. See Upgrading the Primary VCX Server.
- Upgrade the secondary VCX server. See Upgrading the Secondary VCX Server.
- Set up database replication on the primary VCX server. See Set Up Database Replication.

Upgrading the Primary VCX Server

Follow the steps in this section to upgrade the primary VCX server.

1 To start the upgrade process, enter these commands on the primary VCX server:

```
cd /opt/installtemp
tar xvf vcx-all-7.1.yc.tar
cd upgrade-7.1.yc
./install-upgrade
```

The system may prompt you to confirm that a new operating system version will be installed and indicates which disk partition will be used after the upgrade. If you see such a prompt, answer **y.**

The system displays several status messages. The last two messages are:

```
------------------- Installation Completed Successfully -------------------
------------------- VCX version 7.1.yc is now available -------------------
```

2 Switch to the new software version by entering the following command:

vcx-switchversion 7.1.*yc*

The system displays several status messages and then reboots. After the the reboot process has been completed, the system starts VCX 7.1.*y* services.

3 After the system has completed the restart process, verify that the upgrade has occurred by entering this command:

ls -l /opt/3com/VCX

The symbolic link (VCX) should point to the new version of the VCX software (7.1.*yc*). If the link does not point to the new version, wait a few minutes and reenter the command. This could take several minutes and it is important the link pointer is correct before proceeding.

Example Output

```
/opt/3com/VCX -> /opt/3com/VCX.7.1.yc
```

4 Stop the Authentication and Directory service by entering the following commands:

```
cd /opt/3com/VCX/scripts/rc3.d
./S20vcxdata stop
```

Upgrading the Secondary VCX Server

Follow the steps in this section to upgrade the secondary VCX server.

1 To start the upgrade process, enter these commands on the secondary VCX server:

```
cd /opt/installtemp
tar xvf vcx-all-7.1.yc.tar
cd upgrade-7.1.yc
./install-upgrade
```

The system may prompt you to confirm that a new operating system version will be installed and indicates which disk partition will be used after the upgrade. If you see such a prompt, answer **y.**

The system displays several status messages. The last two messages are:

```
------------------- Installation Completed Successfully -------------------
------------------- VCX version 7.1.yc is now available -------------------
```

2 Switch to the new software version by entering the following command:

```
vcx-switchversion 7.1.yc
```

The system displays several status messages and then reboots. After the the reboot process has been completed, the system starts VCX 7.1.*y* services.

3 After the system has completed the restart process, verify that the upgrade has occurred by entering this command:

```
ls -l /opt/3com/VCX
```

The symbolic link (VCX) should point to the new version of the VCX software (7.1.*yc*). If the link does not point to the new version, wait a few minutes and reenter the command. This could take several minutes and it is important the link pointer is correct before proceeding.

Example Output

```
/opt/3com/VCX -> /opt/3com/VCX.7.1.yc
```

4 Stop the Authentication and Directory service by entering the following commands:

```
cd /opt/3com/VCX/scripts/rc3.d
./S20vcxdata stop
```

Set Up Database Replication

Follow the steps in this section to set up database replication.

1 Stop the Tomcat process, first on the primary VCX server and then on the secondary VCX server by entering these commands:

```
cd /opt/3com/VCX/scripts/rc3.d
./S70tomcat stop
```

2 Set up replication on the primary VCX server by entering these commands:

```
cd /opt/3com/VCX/vcxdata/bin
su cworks
./setupReplication
```

The replication setup script starts. Follow these steps:

a The `Enter the VCX Site Identification i.e. Site Id` prompt appears.

Enter site ID configured for this system. For single-site systems, the site ID is identical for both the primary VCX server and the secondary VCX server.

b The `Enter the Number of MASTER SITEs other than the MASTER DEFINITION SITE [1]:` prompt appears.

Press *Enter* to accept the default.

c The `Enter the MASTER DEFINITION SITE IP Address [IP address]` prompt appears.

Enter the IP address of the Master Definition site or press *Enter* if the displayed address is correct. This is typically the IP address of eth0 on the primary VCX server.

d The `Enter the MASTER SITE 1 IP Address [0.0.0.0]` prompt appears.

Enter the IP address of the Master Site. This is typically the IP address of eth0 on the secondary VCX server.

e The `Do you want to continue with the above settings? [n/y]:` prompt appears.

Enter **`y`** to continue. The script executes.

During script execution, messages appear describing the replication setup. Messages also appear stating that firewall setup should allow communication between the primary VCX server and the secondary VCX server. These messages are a reminder—firewall setup was performed during VCX software installation.

f The `Have you executed the ABOVE mentioned VCX-FIREWALL steps? [y/n]:` prompt appears.

Enter **`y`** to continue. The script executes.

When the replication is complete, *Multi-Master Replication Status* is reported as *NORMAL*. Do not continue to the next step until the replication is complete. Note that replication can take approximately 20 minutes to complete.

g You can check the replication by entering the following command:

```
./checkReplication
```

3 When the replication is complete and status is reported as *NORMAL*, enter the following command to exit the *cworks* account and return to the *root* account:

```
exit
```

4 Start the Authentication and Directory service on the primary VCX server and the secondary VCX server by entering the following commands:

```
cd /opt/3com/VCX/scripts/rc3.d
./S20vcxdata start
```

5 Start the Tomcat process on the primary VCX server and the secondary VCX server by entering the following command:

```
./S70tomcat start
```

6 Start IP Messaging on the primary VCX server by entering the following command:

```
./S60ums start
```

Upgrading a Single-Site System With Four Servers

Single-site VCX systems can have either two servers or four servers.

- In a two-server configuration, each server runs IP Telephony server software and IP Messaging server software.
- In a four-server configuration, one pair of servers runs IP Telephony server software; the second pair of servers runs IP Messaging server software.

Follow the procedures in this section to upgrade the four-server configuration at a single site from one version of VCX software (7.1.*x*) to a later version (7.1.*y*).

Before you begin the upgrade procedures on the four servers, perform these steps.:

1 Log in as *root* on the primary IP Telephony server and on the secondary IP Telephony server.

2 Stop the Tomcat process, first on the primary IP Telephony server and then on the secondary IP Telephony server by entering these commands:

```
cd /opt/3com/VCX/scripts/rc3.d
./S70tomcat stop
```

3 Ensure that database replication has no errors (see Preliminary Steps) and then drop replication on the primary IP Telephony server by entering these commands:

```
cd /opt/3com/VCX/vcxdata/bin
su cworks
./dropReplication
```

The drop replication script starts. Follow these steps:

a The `Enter the VCX Site Identification i.e. Site Id` prompt appears.

Enter site ID configured for this system. For single-site systems, the site ID is identical for both the primary IP Telephony server and the secondary IP Telephony server.

b The `Enter the Number of MASTER SITEs other than the MASTER DEFINITION SITE` [1]: prompt appears.

Press *Enter* to accept the default.

c The `Enter the MASTER DEFINITION SITE IP Address [`*`IP address`*`]` prompt appears.

Enter the IP address of the Master Definition site or press *Enter* if the displayed address is correct. This is typically the IP address of eth0 on the primary VCX server.

d The `Enter the MASTER SITE 1 IP Address [0.0.0.0]` prompt appears.

Enter the IP address of the Master Site. This is typically the IP address of eth0 on the secondary VCX server.

e The `Do you want to continue with the above settings? [n/y]:` prompt appears.

Enter **`y`** to continue. The script executes.

4 Enter the following command to exit the *cworks* account and return to the *root* account:

```
exit
```

5 Stop IP Messaging, first on the primary IP Messaging server and then on the secondary IP Messaging server by entering these commands:

```
cd /opt/3com/VCX/scripts/rc3.d
./S60ums stop
```

6 Obtain a copy of the `vcx-softswitch-7.1.`*`y`*`c.tar` software upgrade file and place it in the `/opt/installtemp` directory on the primary IP Telephony server and on the secondary IP Telephony server. The variable *`y`* indicates the version of VCX software (for example, `vcx-all-7.0.3c.tar`) that will replace the current version. The letter `c` is always appended to the version number.

7 Obtain a copy of the `vcx-ipmsg-7.1.yc.tar` software upgrade file and place it in the `/opt/installtemp` directory on the primary IP Messaging server and on the secondary IP Messaging server.

Next, execute the following steps in the order listed:

- Upgrade the primary IP Telephony server. See Upgrading the Primary IP Telephony Server.
- Upgrade the primary IP Messaging server. See Upgrading the Primary IP Messaging Server.
- Upgrade the secondary IP Telephony server. See Upgrading the Secondary IP Telephony Server.
- Upgrade the primary IP Messaging server. See Upgrading the Secondary IP Messaging Server.
- Set up database replication on the primary IP Telephony server. See Set Up Database Replication.

Upgrading the Primary IP Telephony Server

Follow the steps in this section to upgrade the primary IP Telephony server.

1 To start the upgrade process, enter these commands on the primary IP Telephony server:

```
cd /opt/installtemp
tar xvf vcx-softswitch-7.1.yc.tar
cd upgrade-7.1.yc
./install-upgrade
```

The system may prompt you to confirm that a new operating system version will be installed and indicates which disk partition will be used after the upgrade. If you see such a prompt, answer **y.**

The system displays several status messages. The last two messages are:

```
------------------- Installation Completed Successfully -------------------
------------------- VCX version 7.1.yc is now available -------------------
```

2 Switch to the new software version by entering the following command:

```
vcx-switchversion 7.1.yc
```

The system displays several status messages and then reboots. After the the reboot process has been completed, the system starts VCX 7.1.*y* IP Telephony services.

3 After the system has completed the restart process, verify that the upgrade has occurred by entering this command:

```
ls -l /opt/3com/VCX
```

The symbolic link (VCX) should point to the new version of the VCX software (7.1.*yc*). If the link does not point to the new version, wait a few minutes and reenter the command. This could take several minutes and it is important the link pointer is correct before proceeding.

Example Output

```
/opt/3com/VCX -> /opt/3com/VCX.7.1.yc
```

4 Stop the Authentication and Directory service by entering the following commands:

```
cd /opt/3com/VCX/scripts/rc3.d
./S20vcxdata stop
```

Upgrading the Primary IP Messaging Server

Follow the steps in this section to upgrade the primary IP Messaging server.

1 To start the upgrade process, enter these commands on the primary IP Messaging server:

```
cd /opt/installtemp
tar xvf vcx-ipmsg-7.1.yc.tar
cd upgrade-7.1.yc
./install-upgrade
```

The system may prompt you to confirm that a new operating system version will be installed and indicates which disk partition will be used after the upgrade. If you see such a prompt, answer **y.**

The system displays several status messages. The last two messages are:

```
------------------- Installation Completed Successfully -------------------
------------------- VCX version 7.1.yc is now available -------------------
```

2 Switch to the new software version by entering the following command:

```
vcx-switchversion 7.1.yc
```

The system displays several status messages and then reboots. After the the reboot process has been completed, the system starts VCX 7.1.*y* IP Messaging services.

3 After the system has completed the restart process, verify that the upgrade has occurred by entering this command:

```
ls -l /opt/3com/VCX
```

The symbolic link (VCX) should point to the new version of the VCX software (7.1.*yc*). If the link does not point to the new version, wait a few minutes and reenter the command. This could take several minutes and it is important the link pointer is correct before proceeding.

Example Output

```
/opt/3com/VCX -> /opt/3com/VCX.7.1.yc
```

Upgrading the Secondary IP Telephony Server

Follow the steps in this section to upgrade the secondary IP Telephony server.

1. To start the upgrade process, enter these commands on the secondary IP Telephony server:

   ```
   cd /opt/installtemp
   tar xvf vcx-softswitch-7.1.yc.tar
   cd upgrade-7.1.yc
   ./install-upgrade
   ```

   The system may prompt you to confirm that a new operating system version will be installed and indicates which disk partition will be used after the upgrade. If you see such a prompt, answer **y.**

   The system displays several status messages. The last two messages are:

```
------------------- Installation Completed Successfully -------------------
------------------- VCX version 7.1.yc is now available -------------------
```

2. Switch to the new software version by entering the following command:

   ```
   vcx-switchversion 7.1.yc
   ```

   The system displays several status messages and then reboots. After the the reboot process has been completed, the system starts VCX 7.1.*y* IP Telephony services.

3. After the system has completed the restart process, verify that the upgrade has occurred by entering this command:

   ```
   ls -l /opt/3com/VCX
   ```

   The symbolic link (VCX) should point to the new version of the VCX software (7.1.*yc*). If the link does not point to the new version, wait a few minutes and reenter the command. This could take several minutes and it is important the link pointer is correct before proceeding.

Example Output

```
/opt/3com/VCX -> /opt/3com/VCX.7.1.yc
```

4 Stop the Authentication and Directory service by entering the following commands:

```
cd /opt/3com/VCX/scripts/rc3.d
./S20vcxdata stop
```

Upgrading the Secondary IP Messaging Server

Follow the steps in this section to upgrade the secondary IP Messaging server.

1 To start the upgrade process, enter these commands on the secondary IP Messaging server:

```
cd /opt/installtemp
tar xvf vcx-ipmsg-7.1.yc.tar
cd upgrade-7.1.yc
./install-upgrade
```

The system may prompt you to confirm that a new operating system version will be installed and indicates which disk partition will be used after the upgrade. If you see such a prompt, answer **y.**

The system displays several status messages. The last two messages are:

```
------------------- Installation Completed Successfully -------------------
------------------- VCX version 7.1.yc is now available -------------------
```

2 Switch to the new software version by entering the following command:

```
vcx-switchversion 7.1.yc
```

The system displays several status messages and then reboots. After the the reboot process has been completed, the system starts VCX 7.1.*y* IP Messaging services.

3 After the system has completed the restart process, verify that the upgrade has occurred by entering this command:

```
ls -l /opt/3com/VCX
```

The symbolic link (VCX) should point to the new version of the VCX software (7.1.*yc*). If the link does not point to the new version, wait a few minutes and reenter the command. This could take several minutes and it is important the link pointer is correct before proceeding.

Example Output

```
/opt/3com/VCX -> /opt/3com/VCX.7.1.yc
```

Set Up Database Replication

Follow the steps in this section to set up database replication.

1 Stop the Tomcat process, first on the primary IP Telephony server and then on the secondary IP Telephony server by entering these commands (log in as *root*):

```
cd /opt/3com/VCX/scripts/rc3.d
./S70tomcat stop
```

2 Set up replication on the primary IP Telephony server by entering these commands:

```
cd /opt/3com/VCX/vcxdata/bin
su cworks
./setupReplication
```

The replication setup script starts. Follow these steps:

a The `Enter the VCX Site Identification i.e. Site Id` prompt appears.

Enter site ID configured for this system. For single-site systems, the site ID is identical for both the primary IP Telephony server and the secondary IP Telephony server.

b The `Enter the Number of MASTER SITEs other than the MASTER DEFINITION SITE` [1]: prompt appears.

Press *Enter* to accept the default.

c The `Enter the MASTER DEFINITION SITE IP Address [`*`IP address`*`]` prompt appears.

Enter the IP address of the Master Definition site or press *Enter* if the displayed address is correct. This is typically the IP address of eth0 on the primary VCX server.

d The `Enter the MASTER SITE 1 IP Address [0.0.0.0]` prompt appears.

Enter the IP address of the Master Site. This is typically the IP address of eth0 on the secondary VCX server.

e The `Do you want to continue with the above settings? [n/y]:` prompt appears.

Enter **`y`** to continue. The script executes.

During script execution, messages appear describing the replication setup. Messages also appear stating that firewall setup should allow communication between the primary IP Telephony server and the

secondary IP Telephony server. These messages are a reminder—firewall setup was performed during VCX software installation.

f The `Have you executed the ABOVE mentioned VCX-FIREWALL steps? [y/n]:` prompt appears.

Enter **`y`** to continue. The script executes.

When the replication is complete, *Multi-Master Replication Status* is reported as *NORMAL*. Do not continue to the next step until the replication is complete. Note that replication can take approximately 20 minutes to complete.

g You can check the replication by entering the following command:

```
./checkReplication
```

3 When the replication is complete, enter the following command to exit the *cworks* account and return to the *root* account:

```
exit
```

4 Start the Authentication and Directory service on the primary IP Telephony server and the secondary IP Telephony server by entering the following commands:

```
cd /opt/3com/VCX/scripts/rc3.d
./S20vcxdata start
```

5 Start the Tomcat process on the primary IP Telephony server and the secondary IP Telephony server by entering the following command:

```
./S70tomcat start
```

Upgrading a Multi-Site System With No Branch Offices

Some VCX multi-site systems have regional offices but no branch offices. Each regional office contains a primary VCX server and a secondary VCX server. These servers perform call processing and IP Messaging tasks. One of the regional offices also contains a Call Records server which gathers call records from each of the regional offices.

- To upgrade the primary VCX server and the secondary VCX server, follow the instructions in Upgrading a Single-Site System With Two Servers earlier in this appendix.
- To upgrade the Call Records server, see the following section, Upgrading the Call Records Server.

Upgrading the Call Records Server

To upgrade the Call Records server:

1. Log in to the Call Records server as *root*.
2. Stop all VCX processes on the Call Records server by entering the following command:

   ```
   cd /etc/init.d
   ./vcx stop
   ```

3. Obtain a copy of the `vcx-bss-7.1.yc.tar` software upgrade file and place it in the `/opt/installtemp` directory on the Call Records server.
4. Enter these commands:

   ```
   cd /opt/installtemp
   tar xvf vcx-bss-7.1.yc.tar
   cd upgrade-7.1.yc
   ./install-upgrade
   ```

   The system may prompt you to confirm that a new operating system version will be installed and indicates which disk partition will be used after the upgrade. If you see such a prompt, answer **y.**

   The system displays several status messages. The last two messages are:

```
------------------- Installation Completed Successfully -------------------
------------------- VCX version 7.1.yc is now available -------------------
```

5. Change to the new software version by entering this command:

   ```
   vcx-switchversion 7.1.yc
   ```

   The system displays several status messages and then reboots. When the reboot process has been completed, the system starts VCX 7.1.*yc* services.

6. After the system has completed the restart process, verify that the upgrade has occurred by entering the following command:

   ```
   ls -l /opt/3com/VCX
   ```

   The symbolic link (VCX) should point to the new version of the VCX software (7.1.*yc*). If the link does not point to the new version, wait a few minutes and reenter the command. This could take several minutes and it is important the link pointer is correct before proceeding.

   Example Output: `/opt/3com/VCX -> /opt/3com/VCX.7.1.yc`

Upgrading a Multi-Site VCX System with Branch Offices

Some multi-site VCX systems have regional offices and branch offices. Each branch office is associated with a regional office.

Multi-site VCX systems can be categorized by the method used to implement messaging.

- In a multi-site VCX system configured to use *local* messaging, the IP Messaging server is co-located with the IP Telephony server at each branch office. In this case, each branch office provides messaging services for its users.
- In a multi-site VCX system configured to use *global* messaging, the IP Messaging server is located on the regional office. Each branch office runs the IP Telephony server only. In this case, the regional office provides messaging services for users at each branch office.
- In version 7.1 multi-site VCX systems, you can configure branch and regional sites to use Global Voicemail Integration. Each location must be running IP Messaging services, which means that, in a multi-site system configured to use global messaging, you cannot enable Global Voicemail Integration on a branch. You can, however, enable Global Voicemail Integration on the region providing IP Messaging services to the branch.

  This service is provided by a pair of Global Voicemail Central Servers (GVCS) to enable global voicemail integration on an entire IP Messaging system.

  A GVCS coordinates mailbox creation and mailbox updates on regional and branch office IP Messaging servers. You must install IP Messaging software on a GVCS, and then set up the GVCS through the IP Messaging administrator configuration interface *before* enabling global voicemail integration on regional and branch office IP Messaging servers. Refer to the *IP Messaging Module Operations and System Administration Guide* for more information and for configuration options.

  Once you have installed and configured a GVCS, you can add existing IP Messaging servers to the Global Voicemail Integration system by running the `vcx-reconfigure` command on each server (see Chapter 7).

Follow the procedures in this section to upgrade a multi-site VCX system from version 7.1.*x* to 7.1.*y*. The components in a multi-site VCX system can be set up in many possible configurations. The procedures in this

section are based on a multi-site VCX system that includes two regions (Region 1 and Region 2) with multiple branch offices in each region.

All upgrade commands are executed locally at the console.

When upgrading a region-to-region office configuration, you must drop replication between the Authentication and Directory server in each region.

***CAUTION**: When upgrading a multi-site VCX system, upgrade the regional servers before upgrading the branch servers. If you upgrade the branch servers first, the database schema on the branches may not match the schema version on the region causing database replication failure.*

Multi-Site VCX System Upgrade Order

When upgrading a multi-site VCX system configuration, upgrade the components in the following order:

- If you plan to enable Global Voicemail Integration, install IP Messaging software on a pair of Global Voicemail Central Servers, and then set up the GVCS through the IP Messaging administrator configuration interface *before* enabling global voicemail integration on regional and branch office IP Messaging servers.
- Upgrade the replicated Authentication and Directory servers in each regional office.
- Upgrade the IP Messaging servers in each regional office.
- Upgrade the Call servers in each regional office.
- Upgrade the Call Records server (optional).
- Upgrade the branch offices hosted by a region.

Upgrading the Regional Authentication and Directory Servers

This section describes how to upgrade the Authentication and Directory servers in Region 1 and Region 2.

In this example of two-region replication, replication is only dropped for one master site. As the number of regions increases, so does the complexity of replication. The upgrade process for Authentication and Directory servers in a multi-region system depends on the servers have been installed.

To upgrade the Authentication and Directory server in Region 1:

1. Log in, as *root*, to the Call server in Region 1.
2. Stop the Tomcat process by entering the following commands:

```
cd /opt/3com/VCX/scripts/rc3.d
./S70tomcat stop
```

3. Log in, as *root*, to the Authentication and Directory server in Region 1.
4. Ensure that database replication has no errors (see Preliminary Steps) and then drop replication by entering the following commands:

```
cd /opt/3com/VCX/vcxdata/bin
su cworks
./dropReplication
```

The drop replication script starts. Follow these steps:

a The `Enter the VCX Site Identification i.e. Site Id` prompt appears.

Enter the site ID configured for Region 1.

b The `Enter the Number of MASTER SITEs other than the MASTER DEFINITION SITE:` prompt appears.

Enter the number of Master sites. To determine the number of Master sites associated with this server, use the *listVcxdata* command. See Manually Configuring Replication for an IP Telephony Server or IP Telephony and Messaging Server for more information. In this example, there is one Master site, Region 2.

c The `Enter the MASTER DEFINITION SITE IP Address [`*`IP address`*`]` prompt appears.

Enter the IP address of the Master Definition site. This is the IP address of the eth0 interface on this server (the Authentication and Directory server in Region 1).

d The `Enter the MASTER SITE 1 IP Address [0.0.0.0]` prompt appears.

Enter the IP address of the Master Site. This is the IP address of the eth0 interface on the Authentication and Directory server in Region 2. If there are more than one Master Sites, this question repeats until the number of master sites specified in step **b** is reached.

e The `Do you want to continue with the above settings? [n/y]:` prompt appears.

Enter **`y`** to continue. The script executes.

5 Enter the following command to exit the *cworks* account and return to the *root* account:

```
exit
```

6 Obtain a copy of the `vcx-dataserver-7.1.yc.tar` software upgrade file and place it in the `/opt/installtemp` directory on the Authentication and Directory server. The variable *y* indicates the version of VCX software (for example, `vcx-all-7.1.3c.tar`) that will replace the current version. The letter `c` is always appended to the version number.

7 Enter these commands:

```
cd /opt/installtemp
tar xvf vcx-dataserver-7.1.yc.tar
cd upgrade-7.1.y
./install-upgrade
```

The system may prompt you to confirm that a new operating system version will be installed and indicates which disk partition will be used after the upgrade. If you see such a prompt, answer **y.**

The system displays several status messages. The last two messages are:

```
------------------- Installation Completed Successfully -------------------
------------------- VCX version 7.1.yc is now available -------------------
```

8 Change to the new software version by entering this command:

```
vcx-switchversion 7.1.yc
```

The system displays several status messages and then reboots. When the reboot process has been completed, the system starts VCX 7.1.*yc* Authentication and Directory service.

9 After the system has completed the restart process, verify that the upgrade has occurred by entering the following command:

```
ls -l /opt/3com/VCX
```

The symbolic link (VCX) should point to the new version of the VCX software (7.1.*yc*). If the link does not point to the new version, wait a few minutes and reenter the command. This could take several minutes and it is important the link pointer is correct before proceeding.

Example Output: `/opt/3com/VCX -> /opt/3com/VCX.7.1.yc`

10 Enter the following commands to stop the Authentication and Directory server on Region 1:

```
cd /opt/3com/VCX/scripts/rc3.d
./S20vcxdata stop
```

To upgrade the Authentication and Directory server in Region 2:

1. Log in, as *root*, to the Call server in Region 2.
2. Stop the Tomcat process by entering the following commands:

```
cd /opt/3com/VCX/scripts/rc3.d
./S70tomcat stop
```

3. Log in, as *root*, to the Authentication and Directory server in Region 2.
4. Ensure that database replication has no errors (see Preliminary Steps) and then drop replication by entering the following commands:

```
cd /opt/3com/VCX/vcxdata/bin
su cworks
./dropReplication
```

The drop replication script starts. Follow these steps:

a The `Enter the VCX Site Identification i.e. Site Id` prompt appears.

Enter the site ID configured for Region 2.

b The `Enter the Number of MASTER SITEs other than the MASTER DEFINITION SITE:` prompt appears.

Enter the number of Master sites. To determine the number of Master sites associated with this server, use the *listVcxdata* command. See Manually Configuring Replication for an IP Telephony Server or IP Telephony and Messaging Server for more information. In this example, there is one Master site, Region 1.

c The `Enter the MASTER DEFINITION SITE IP Address [`*`IP address`*`]` prompt appears.

Enter the IP address of the Master Definition site. This is the IP address of the eth0 interface on this server (the Authentication and Directory server in Region 2).

d The `Enter the MASTER SITE 1 IP Address [0.0.0.0]` prompt appears.

Enter the IP address of the Master Site. This is the IP address of the eth0 interface on the Authentication and Directory server in Region 1. If there are more than one Master Sites, this question repeats until the number of master sites specified in step **b** is reached.

e The `Do you want to continue with the above settings? [n/y]:` prompt appears.

Enter **`y`** to continue. The script executes.

5 Enter the following command to exit the *cworks* account and return to the *root* account:

```
exit
```

6 Obtain a copy of the `vcx-dataserver-7.1.yc.tar` software upgrade file and place it in the `/opt/installtemp` directory on the Authentication and Directory server. The variable *y* indicates the version of VCX software (for example, `vcx-dataserver-7.1.3c.tar)` that will replace the current version. The letter `c` is always appended to the version number.

7 Enter these commands:

```
cd /opt/installtemp
tar xvf vcx-dataserver-7.1.yc.tar
cd upgrade-7.1.y
./install-upgrade
```

The system may prompt you to confirm that a new operating system version will be installed and indicates which disk partition will be used after the upgrade. If you see such a prompt, answer **y.**

The system displays several status messages. The last two messages are:

```
------------------- Installation Completed Successfully -------------------
------------------- VCX version 7.1.yc is now available -------------------
```

8 Change to the new software version by entering this command:

```
vcx-switchversion 7.1.yc
```

The system displays several status messages and then reboots. When the reboot process has been completed, the system starts VCX 7.1.*yc* Authentication and Directory service.

9 After the system has completed the restart process, verify that the upgrade has occurred by entering the following command:

```
ls -l /opt/3com/VCX
```

The symbolic link (VCX) should point to the new version of the VCX software (7.1.*yc*). If the link does not point to the new version, wait a few minutes and reenter the command. This could take several minutes and it is important the link pointer is correct before proceeding.

Example Output: `/opt/3com/VCX -> /opt/3com/VCX.7.1.yc`

10 Enter the following commands to stop the Authentication and Directory server on Region 2:

```
cd /opt/3com/VCX/scripts/rc3.d
./S20vcxdata stop
```

At this point, you have upgraded the Authentication and Directory server on Region 1 and Region 2, and you have stopped database replication in both regions. The following steps upgrade the databases in each region, set up replication in each region, and restart the Authentication and Directory server in each region. You should still be logged in, as *root*, in each region.

1. On the Authentication and Directory server in Region 1, upgrade the Region 2 database by entering the following commands:

   ```
   su - cworks
   cd /opt/3com/VCX/vcxdata/bin
   ./upgradeVcxdata
   ```

   The `Enter the VCX Site Identification i.e. Site Id:` prompt appears.

2. Enter the Site ID for Region 2.

3. On the Authentication and Directory server in Region 2, upgrade the Region 1 database by entering the following commands:

   ```
   su - cworks
   cd /opt/3com/VCX/vcxdata/bin
   ./upgradeVcxdata
   ```

   The `Enter the VCX Site Identification i.e. Site Id:` prompt appears.

4. Enter the Site ID for Region 1.

5. Set up database replication on Region 1 by entering the following commands (you should still be logged in to the Authentication and Directory server as *cworks*):

   ```
   cd /opt/3com/VCX/vcxdata/bin
   ./setupReplication
   ```

   The replication setup script starts. Follow these steps:

   a. The `Enter the VCX Site Identification i.e. Site Id` prompt appears.

      Enter site ID configured for Region 1.

   b. The `Enter the Number of MASTER SITEs other than the MASTER DEFINITION SITE:` prompt appears.

      Enter the number of Master sites. To determine the number of Master Sites associated with this office, use the *listVcxdata* command. See Manually Configuring Replication for an IP Telephony Server or IP

Telephony and Messaging Server for more information. In this example, there is one Master site, Region 2.

c The `Enter the MASTER DEFINITION SITE IP Address [IP address]` prompt appears.

Enter the IP address of the Master Definition site. This is the IP address of the eth0 interface on this server (the Authentication and Directory server in Region 1).

d The `Enter the MASTER SITE 1 IP Address [0.0.0.0]` prompt appears.

Enter the IP address of the Master Site. This is the IP address of the eth0 interface on the Authentication and Directory server in Region 2. If there are more than one Master Sites, this question repeats until the number of master sites specified in step **b** is reached.

e The `Do you want to continue with the above settings? [n/y]:` prompt appears.

Enter **`y`** to continue. The script executes.

When the replication is complete, *Multi-Master Replication Status* is reported as *NORMAL*. Do not continue to the next step on this server until the replication is complete. Note that replication can take approximately 20 minutes to complete.

f You can check the replication by entering the following command:

```
./checkReplication
```

6 Set up database replication on Region 2 by entering the following commands (you should still be logged in to the Authentication and Directory server as *cworks*):

```
cd /opt/3com/VCX/vcxdata/bin
./setupReplication
```

The replication setup script starts. Follow these steps:

a The `Enter the VCX Site Identification i.e. Site Id` prompt appears.

Enter site ID configured for Region 2.

b The `Enter the Number of MASTER SITEs other than the MASTER DEFINITION SITE:` prompt appears.

Enter the number of Master sites. To determine the number of Master Sites associated with this office, use the *listVcxdata* command. See Manually Configuring Replication for an IP Telephony Server or IP

Telephony and Messaging Server for more information. In this example, there is one Master site, Region 1.

c The `Enter the MASTER DEFINITION SITE IP Address [IP address]` prompt appears.

Enter the IP address of the Master Definition site. This is the IP address of the eth0 interface on this server (the Authentication and Directory server in Region 2).

d The `Enter the MASTER SITE 1 IP Address [0.0.0.0]` prompt appears.

Enter the IP address of the Master Site. This is the IP address of the eth0 interface on the Authentication and Directory server in Region 1. If there are more than one Master Sites, this question repeats until the number of master sites specified in step **b** is reached.

e The `Do you want to continue with the above settings? [n/y]:` prompt appears.

Enter **`y`** to continue. The script executes.

When the replication is complete, *Multi-Master Replication Status* is reported as *NORMAL*. Do not continue to the next step on this server until the replication is complete. Note that replication can take approximately 20 minutes to complete.

f You can check the replication by entering the following command:

```
./checkReplication
```

7 Once replication is complete and status is *NORMAL* on Region 1 and Region 2, start the Authentication and Directory servers in each region by entering the following commands while logged in as *root*:

```
cd /opt/3com/VCX/scripts/rc3.d
./S20vcxdata start
```

8 Start the Tomcat process on the primary Call server and the secondary Call server in each region by entering the following commands:

```
cd /opt/3com/VCX/scripts/rc3.d
./S70tomcat start
```

Upgrading the Regional IP Messaging Servers

This section describes how to upgrade regional IP Messaging servers. These servers may provide messaging services for users using one of the following methods:

- Global Voicemail Integration — In version 7.1, multi-site VCX systems can be configured to use Global Voicemail Integration. This service is

provided by a pair of Global Voicemail Central Servers (GVCS) to enable global voicemail integration on an entire IP Messaging system. See Upgrading a Multi-Site VCX System with Branch Offices and the IP Messaging documentation.

- Local messaging — Messaging services are provided to remote users by the regional office.
- Global messaging — Messaging services are provided to users locally, by the either a regional office or a branch office.

For local and global messaging, you need to perform the steps in this section on a console attached to each IP Messaging server in all regions (Region 1 and Region 2 in this example).

For Global Voicemail Integration, the Global Voicemail Central Servers (GVCS) must be installed, and then configured through the IP Messaging administrator configuration interface *before* enabling global voicemail integration on regional and branch office IP Messaging servers. Refer to the *IP Messaging Module Operations and System Administration Guide* for more information and for configuration options.

Once you have installed and configured a GVCS, you can add existing IP Messaging servers to the Global Voicemail Integration system by running the `vcx-reconfigure` command on each server (see Chapter 7).

IP Messaging servers are typically configured in pairs, with one server acting as the primary and the other acting as the secondary. The primary IP Messaging server and a secondary IP Messaging server may be located in the same region or in different regions.

To upgrade the IP Messaging servers:

1. Stop the primary IP Messaging server and a secondary IP Messaging server by entering the following commands, as *root*, on each server:

   ```
   cd /opt/3com/VCX/scripts/rc3.d
   ./S60ums stop
   ```

2. Obtain a copy of the `vcx-ipmsg-7.1.yc.tar` software upgrade file and place it in the `/opt/installtemp` directory on the primary IP Messaging server and on the secondary IP Messaging server.
3. Upgrade the primary IP Messaging server by following these steps:
   a. Start the upgrade process by entering the following commands:

      ```
      cd /opt/installtemp
      ```

```
tar xvf vcx-ipmsg-7.1.yc.tar
cd upgrade-7.1.yc
./install-upgrade
```

The system may prompt you to confirm that a new operating system version will be installed and indicates which disk partition will be used after the upgrade. If you see such a prompt, answer **y.**

The system displays several status messages. The last two messages are:

```
------------------- Installation Completed Successfully -------------------
------------------- VCX version 7.1.yc is now available -------------------
```

b Switch to the new software version by entering the following command:

```
vcx-switchversion 7.1.yc
```

The system displays several status messages and then reboots. After the reboot process has been completed, the system starts VCX 7.1.*y* IP Messaging services.

c After the system has completed the restart process, verify that the upgrade has occurred by entering this command:

```
ls -l /opt/3com/VCX
```

The symbolic link (VCX) should point to the new version of the VCX software (7.1.*yc*). If the link does not point to the new version, wait a few minutes and reenter the command. This could take several minutes and it is important the link pointer is correct before proceeding.

Example Output

```
/opt/3com/VCX -> /opt/3com/VCX.7.1.yc
```

4 Upgrade the secondary IP Messaging server by following the procedure described in step 3.

Upgrading the Regional Call Servers

This section describes how to upgrade regional Call servers. Call servers are typically installed in redundant pairs (primary and secondary) in a multi-site VCX system. You need to perform the steps in this section on a console attached to each Call server in all regions (Region 1 and Region 2 in this example).

To upgrade the Call servers:

1. Log on, as *root*, to the primary Call server and the secondary Call server in a region.
2. Obtain a copy of the `vcx-callserver-7.1.yc.tar` software upgrade file and place it in the `/opt/installtemp` directory on the primary Call server and on the secondary Call server.
3. Upgrade the primary Call server by following these steps:
   a. Start the upgrade process by entering the following commands:

      ```
      cd /opt/installtemp
      tar xvf vcx-callserver-7.1.yc.tar
      cd upgrade-7.1.yc
      ./install-upgrade
      ```

      The system may prompt you to confirm that a new operating system version will be installed and indicates which disk partition will be used after the upgrade. If you see such a prompt, answer **y.**

      The system displays several status messages. The last two messages are:

```
------------------- Installation Completed Successfully -------------------
------------------- VCX version 7.1.yc is now available -------------------
```

   b. Switch to the new software version by entering the following command:

      ```
      vcx-switchversion 7.1.yc
      ```

      The system displays several status messages and then reboots. After the reboot process has been completed, the system starts VCX 7.1.*y* Call server.

   c. After the system has completed the restart process, verify that the upgrade has occurred by entering this command:

      ```
      ls -l /opt/3com/VCX
      ```

      The symbolic link (VCX) should point to the new version of the VCX software (7.1.*yc*). If the link does not point to the new version, wait a few minutes and reenter the command. This could take several minutes and it is important the link pointer is correct before proceeding.

      Example Output

      ```
      /opt/3com/VCX -> /opt/3com/VCX.7.1.yc
      ```

4 Upgrade the secondary Call server by following the procedure described in step 3.

Upgrading the Regional Call Records Server

This section describes how to upgrade regional the Call Records server. In a multi-site VCX system, a single Call server typically supports all regional offices. You need to perform the steps in this section on a console attached to the regional Call server.

To upgrade the Call Records server:

1 Log in to the Call Records server as *root*.

2 Obtain a copy of the `vcx-bss-7.1.yc.tar` software upgrade file and place it in the `/opt/installtemp` directory on the Call Records server.

3 Enter these commands:

```
cd /opt/installtemp
tar xvf vcx-bss-7.1.yc.tar
cd upgrade-7.1.yc
./install-upgrade
```

The system may prompt you to confirm that a new operating system version will be installed and indicates which disk partition will be used after the upgrade. If you see such a prompt, answer **y.**

The system displays several status messages. The last two messages are:

```
------------------- Installation Completed Successfully -------------------
------------------- VCX version 7.1.yc is now available -------------------
```

4 Change to the new software version by entering this command:

```
vcx-switchversion 7.1.yc
```

The system displays several status messages and then reboots. When the reboot process has been completed, the system starts VCX 7.1.*yc* services.

5 After the system has completed the restart process, verify that the upgrade has occurred by entering the following command:

```
ls -l /opt/3com/VCX
```

The symbolic link (VCX) should point to the new version of the VCX software (7.1.*yc*). If the link does not point to the new version, wait a few minutes and reenter the command. This could take several minutes and it is important the link pointer is correct before proceeding.

Example Output: `/opt/3com/VCX -> /opt/3com/VCX.7.1.yc`

Upgrading the Branch Offices

This section describes how to upgrade branch offices. Each branch office is associated with a regional office.

As noted in Upgrading a Multi-Site VCX System with Branch Offices, multi-site VCX systems can be categorized by the method used to implement messaging: global messaging, local messaging, or Global Voicemail Integration.

The procedures in this section are based on a multi-site VCX system that includes two regions (Region 1 and Region 2). For this example system, the branches in Region 1 use local messaging, and the branches in Region 2 use global messaging.

- A branch that implements local messaging runs IP Telephony and IP Messaging server software. Because this type of branch office includes IP Messaging services, you can enable Global Voicemail Integration on the branch.
- A branch that implements global messaging runs IP Telephony server software. The IP Messaging server software running on a regional server provides messaging services for the branch. Because this type of branch office receives its IP Messaging services from a regional IP Messaging server, you cannot enable Global Voicemail Integration on the branch. In this case, you must enable Global Voicemail Integration on the regional server.

You can add existing IP Messaging servers to the Global Voicemail Integration system by running the `vcx-reconfigure` command on each server (see Chapter 7).

All upgrade commands are executed locally at the console.

***CAUTION**: When upgrading a multi-site VCX system, upgrade the regional servers before upgrading the branch servers. If you upgrade the branch servers first, the database schema on the branches may not match the schema version on the region causing database replication failure.*

To upgrade the branch offices in Region 1 (local messaging):

1. Log in to the first branch office server as *root*.
2. Obtain a copy of the `vcx-all-7.1.`*yc*`.tar` software upgrade file and place it in the `/opt/installtemp` directory on the branch office server. The variable *y* indicates the version of VCX software (for example,

vcx-all-7.1.3c.tar) that will replace the current version. The letter c is always appended to the version number.

3 To start the upgrade process, enter the following commands:

```
cd /opt/installtemp
tar xvf vcx-all-7.1.yc.tar
cd upgrade-7.1.yc
./install-upgrade
```

The system may prompt you to confirm that a new operating system version will be installed and indicates which disk partition will be used after the upgrade. If you see such a prompt, answer **y.**

The system displays several status messages. The last two messages are:

```
------------------- Installation Completed Successfully -------------------
------------------- VCX version 7.1.yc is now available -------------------
```

4 Switch to the new software version by entering the following command:

```
vcx-switchversion 7.1.yc
```

The system displays several status messages and then reboots. After the the reboot process has been completed, the system starts VCX 7.1.y services.

5 After the system has completed the restart process, verify that the upgrade has occurred by entering this command:

```
ls -l /opt/3com/VCX
```

The symbolic link (VCX) should point to the new version of the VCX software (7.1.*yc*). If the link does not point to the new version, wait a few minutes and reenter the command. This could take several minutes and it is important the link pointer is correct before proceeding.

Example Output

```
/opt/3com/VCX -> /opt/3com/VCX.7.1.yc
```

6 Repeat steps 1 through 5 for all the other branch office servers in Region 1.

To upgrade the branch offices in Region 2 (global messaging):

1 Log in to the first branch office server as *root*.

2 Obtain a copy of the vcx-softswitch-7.1.*yc*.tar software upgrade file and place it in the /opt/installtemp directory on the branch office server. The variable *y* indicates the version of VCX software (for example,

`vcx-all-7.1.3c.tar)` that will replace the current version. The letter `c` is always appended to the version number.

3 To start the upgrade process, enter the following commands:

```
cd /opt/installtemp
tar xvf vcx-softswitch-7.1.yc.tar
cd upgrade-7.1.yc
./install-upgrade
```

The system may prompt you to confirm that a new operating system version will be installed and indicates which disk partition will be used after the upgrade. If you see such a prompt, answer **y.**

The system displays several status messages. The last two messages are:

```
------------------- Installation Completed Successfully -------------------
------------------- VCX version 7.1.yc is now available -------------------
```

4 Switch to the new software version by entering the following command:

```
vcx-switchversion 7.1.yc
```

The system displays several status messages and then reboots. After the the reboot process has been completed, the system starts VCX 7.1.*y* services.

5 After the system has completed the restart process, verify that the upgrade has occurred by entering this command:

```
ls -l /opt/3com/VCX
```

The symbolic link (VCX) should point to the new version of the VCX software (7.1.*yc*). If the link does not point to the new version, wait a few minutes and reenter the command. This could take several minutes and it is important the link pointer is correct before proceeding.

Example Output

```
/opt/3com/VCX -> /opt/3com/VCX.7.1.yc
```

6 Repeat steps 1 through 5 for all the other branch office servers in Region 2.

C Upgrading VCX Server Software From V6.0 to V7.0

This appendix describes the procedures required to upgrade a system running VCX server software version 6.0 to VCX server software version 7.0.

This appendix includes the following topics:

- Verifying Software Versions
- Overview of a 6.0 to 7.0 Upgrade
- Upgrading a Single-Site System With Two Servers
- Upgrading a Single-Site System With Four Servers
- Upgrading a Multi-Site System With No Branch Offices
- Upgrading a Multi-Site VCX System with Branch Offices

During a VCX system upgrade or downgrade, users cannot make calls within the system. However, users may be able to make emergency calls, or make calls to and receive calls from destinations outside of the VCX system (that is, the PSTN). This capability depends on the availability, configuration, and capacity of the media gateway (or gateways) set up in the VCX system. See the VCX Installation Guide *for information on configuring a fail-over call route point. Also refer to your gateway documentation.*

Verifying Software Versions

This section describes how to verify the software versions of individual components and entire releases.

Verifying Component Software Versions

To verify what the component software versions are:

1. Log onto the VCX system as *root*.
2. Navigate to */opt/3com/VCX/scripts*.
3. Enter this command:

   `./vcx-assemble --validate`

   This lists all of the components and their software versions that comprise the current running assembly.

Verifying Release Software Version

For any version of VCX software, you can determine the release running on the system by following these steps:

1. Log onto the VCX system as *root*.
2. Enter the following commands:

   `cd /opt/3com`

   `ls -l`

   This command returns a list all of the installed releases and indicates the running VCX version. The running VCX version is preceded by a symbolic link icon (`->`).

```
lrwxrwxrwx 1 root root 21 Oct 13 09:13 VCX -> /opt/3com/VCX.6.0.1c
drwxr-xr-x   10 root root 4096 Oct 10 09:13 VCX.6.0.0c
```

   In this example, the link points to version 6.0.1c. The other listed release, 6.0.0c, is installed, but not running.

Overview of a 6.0 to 7.0 Upgrade

This section provides an overview of the procedures required to upgrade your VCX system from version 6.0 to 7.0. These procedures upgrade the VCX system to an operational state and assume that the VCX system is successfully operating at version 6.0 before you perform the upgrade.

This appendix describes how to upgrade a VCX server by entering commands at a locally attached console. You can also upgrade a VCX server remotely by using 3Com Corporation's Enterprise Management Suite (EMS). EMS is an SNMP-based client/server application. Refer to the

Enterprise Management Suite User Guide for VCX V7000 Components for information.

All components in a VCX system *must* run the same version of VCX software. This requirement has the following implications:

- You cannot upgrade or downgrade one component in a VCX system and not upgrade or downgrade the other system components.
- If you add a server to an existing VCX system (for example, a branch office), the VCX components on the new server must be installed with the same version of the VCX software as the existing components.

CAUTION: *3Com Corporation* strongly *recommends that you perform backups of your VCX system on a regular basis, for example, weekly. These backups should include provisioning database and voicemail database content.*

- *See* Chapter 5 *for information on backing up the provisioning data stored in the VCX Authentication and Directory server database.*
- *See the* IP Messaging Module Operations and System Administration Guide *for information on backing up voicemail and other IP Messaging data.*

In addition, BEFORE *you upgrade your VCX system to a new release, perform these backups again. If the upgrade fails and you must downgrade, you can restore data from these backups as part of the downgrade procedure.*

Prior to performing any upgrade, you should check the following:

- Check the configuration type of the system you are going to upgrade. The upgrade procedure you need to perform depends on your VCX system configuration (see VCX Software Components and VCX Hardware Configurations). You can use the **`vcx-showconfigtype`** command to verify the configuration type. Your configuration determines the correct tar file (or files) required for the upgrade.
- You must stop database replication before starting the upgrade process. On replicated systems, check replication status to make sure it is normal. To check replication status, execute the following steps on the server hosting the Authentication and Directory services database:

  Log in using the *cworks* account.

  Enter: **`cd /opt/3com/VCX/vcxdata/bin`**

Enter: **`./checkReplication`**

The returned status should be *NORMAL*. If replication errors need to be cleared:

Enter: **`./deleteReplicationErrors`**

CAUTION: *Do not attempt an upgrade if there are replication errors that cannot be deleted.*

After the upgrade, you must restart database replication. The steps that document this procedure state that replication can take approximately 20 minutes to complete. The actual time required depends on the size of the database. The steps describe how to ensure replication has completed.

- Acquire the necessary license. For version 7.0, you *must* obtain and install a license key file for each VCX server before you can upgrade from a previous release. See License Keys for more information.

Depending on your configuration, you may need to upgrade the following VCX software components and configurations:

- IP Telephony and IP Messaging server software

  Supported on:

  - Single-site systems with two servers
  - Multi-site systems (configured on regional offices with no branch offices)
  - Multi-site systems (configured on branch offices that use local IP Messaging)

- IP Telephony server software

  Supported on:

  - Single-site systems with four servers
  - Multi-site systems (configured on branch offices that use global IP Messaging)

- IP Messaging server software

  Supported on:

  - Single-site systems with four servers
  - Multi-site systems (configured on regional offices that use global or local IP Messaging)

With version 7.0, you can set up IP Messaging in a client/server configuration. An IP Messaging server can support up to 20 IP Messaging clients. See the *IP Messaging Operations and System Administration Guide* for details. When you upgrade a primary IP Messaging server running version 6.0 IP Messaging software to version 7.0, the upgrade script asks if you want the system to support IP Messaging client systems. If you answer yes, you must be prepared to enter the IP addresses of each client system.

- Call server software

  Supported on multi-site systems (configured on regional offices with branch offices)

- Call Records server software

  Supported on multi-site systems (configured on a single server for regional offices with or without branch offices)

- Authentication and Directory server software

  Supported on multi-site systems (configured on regional offices with branch offices)

You should upgrade each server from a locally attached console. The upgrade procedure includes a reboot of each upgraded server. If you perform an upgrade remotely (using a secure shell client, for example), you will be logged out when the reboot occurs. When you log back in, it may not be apparent that the upgrade has completed. If you enter commands before the upgrade has finished, the upgrade will fail.

Post-Upgrade Requirements

After an upgrade to VCX version 7.0 from any release of VCX version 6.0, you *must* run the configuration script, `admincfg`, described in this section. The script addresses the following issues:

- VCX version 7.0 adds a new Manager role to the VCX Administrator provisioning interface. Running the script adds the new role to the interface, and ensures that administrators can log in to the interface and access Manager-related menu options.
- Access to the Central Manager and the VCX Administrator provisioning interface requires a username and password (see the *VCX Administration Guide*). If you have changed the default password, the procedure for upgrading VCX software from version 6.0 to 7.0 may change your password back to the default. Running the script allows you to reset the default password.

You must execute the following steps on each server running the Call Processor service. Depending on your VCX system configuration, these servers could include the IP Telephony and IP Messaging server, the Call server, and the IP Telephony server. You do not need to run the `admincfg` script on other types of VCX servers (for example, the IP Messaging server).

To run the `admincfg` script:

1. Log on the primary VCX server running the Call Processor service as the *root* user.
2. Run the password management script by entering these commands:

   ```
   cd /opt/3com/VCX/tomcat/scripts/
   ./admincfg
   ```

3. Follow the script prompts to change the password.
4. When the script finishes, enter **Y** to ensure that the changes take effect. You *must* use uppercase; if you use lowercase (**y**), the script will not preserve your changes.
5. Repeat steps 1 through 4 on each server running the Call Processor service.

License Keys

You must obtain and install a license key file for *every* server in a VCX single-site or multi-site system. The key enables the use of the software installed on each VCX type of server.

CAUTION: *After installing a VCX server with version 7.0 software, you must obtain and install a valid license key file before you switch to the new software. If you do not install the file, many software processes that are critical to the proper operation of the server cannot start.*

Obtaining a License Key File

Each license key in the file is uniquely tied to one server through a machine ID.

Upgrading a VCX server requires installing the new software, then switching from the old version to the new version. You obtain the license

key file *after* installing the new software, and install the license key *before* switching to the new version.

Once you have installed the new VCX software on a server, obtain the machine ID for the server by entering the following command while logged in to the *root* account:

```
vcx-showmachineid
```

This command returns a value similar to the following:

```
SNAm-Fro7-vrJa-YKhH-H8az-db7Q
```

Your 3Com Voice Authorized Reseller will supply the license key that corresponds to the machine ID. For the sample machine id shown above the license key filename would be:

```
SNAm-Fro7-vrJa-YKhH-H8az-db7Q.activation,key
```

Save the license key file in the `/opt/installtemp` directory.

3Com strongly recommends that you save copies of your license key files in a separate, safe location. If any VCX server experiences a disk or other failure that requires reinstallation of the VCX software, the license key file must be available for that process.

Installing a License Key File

To install a license key, log on to the server as *root* and enter the following commands:

```
cd /opt/installtemp
vcx-licenseinstall <license key filename>
```

These confirmation messages indicates that the license key has been successfully installed.

```
Activation Key Successfully Validated
Success: Activation key validated and installed.
```

The license key is installed in the `/opt3com/licenses` directory and the activation key is symbolically linked to the license key file as shown in the following example:

```
ls -l
```

```
total 8
lrwxrwxrwx    1 root     root           63 Jun 15 2006
activation.key ->
/opt/3com/licenses/SNAm-Fro7-vrJa-YKhH-H8az-db7Q.activation.
key

-rw-r--r--    1 root     root         1792 Jun 15  2006
SNAm-Fro7-vrJa-YKhH-H8az-db7Q.activation.key
```

CAUTION: *Do not edit this file. The activation key file content is signed. If you edit this file, you will invalidate it.*

You can use the **`vcx-licensequery --all`** command to display information about the currently installed VCX software license, for example, serial number, customer name, expiration date, and number of supported phone and IP Messaging clients.

Upgrading a Single-Site System With Two Servers

Single-site VCX systems can have either two servers or four servers.

- In a two-server configuration, each server runs IP Telephony server software and IP Messaging server software.
- In a four-server configuration, one pair of servers runs IP Telephony server software; the second pair of servers runs IP Messaging server software.

Follow the procedure in this section to upgrade the two-server configuration at a single site from VCX software version 6.0 to version 7.0.

All upgrade commands are executed locally at the console.

Before you begin the upgrade procedures on the primary VCX server and on the secondary VCX server, perform these steps.:

1. Log in as *root* on the primary VCX server and on the secondary VCX server.
2. Stop the Tomcat process, first on the primary VCX server and then on the secondary VCX server by entering these commands:

   ```
   cd /opt/3com/VCX/scripts/rc3.d
   ./S70tomcat stop
   ```

3. Drop database replication on the primary VCX server by entering these commands:

```
cd /opt/3com/VCX/vcxdata/bin
su cworks
./dropReplication
```

The drop replication script starts. Follow these steps:

a The `Enter the VCX Site Identification i.e. Site Id` prompt appears.

Enter site ID configured for this system. For single-site systems, the site ID is identical for both the primary VCX server and the secondary VCX server.

b The `Enter the Number of MASTER SITEs other than the MASTER DEFINITION SITE` [1]: prompt appears.

Press *Enter* to accept the default.

c The `Enter the MASTER DEFINITION SITE IP Address [`*`IP address`*`]` prompt appears.

Enter the IP address of the Master Definition site or press *Enter* if the displayed address is correct. This is typically the IP address of the primary VCX server.

d The `Enter the MASTER SITE 1 IP Address [0.0.0.0]` prompt appears.

Enter the IP address of the Master Site. This is typically the IP address of the secondary VCX server.

e The `Do you want to continue with the above settings? [n/y]:` prompt appears.

Enter **`y`** to continue. The script executes.

4 Enter the following command to exit the *cworks* account and return to the *root* account:

```
exit
```

5 Stop IP Messaging, first on the primary VCX server and then on the secondary VCX server by entering these commands:

```
cd /opt/3com/VCX/scripts/rc3.d
./S60ums stop
```

6 Obtain a copy of the `vcx-all-7.0.`*`x`*`c.tar` software upgrade file and place it in the `/opt/installtemp` directory on the primary VCX server and on the secondary VCX server. The variable *`x`* indicates the version of VCX software (for example, `vcx-all-7.0.3c.tar)` that will replace version 6.0. The letter `c` is always appended to the version number.

Next, execute the following steps in the order listed:

- Upgrade the primary VCX server. See Upgrading the Primary VCX Server.
- Upgrade the secondary VCX server. See Upgrading the Secondary VCX Server.
- Set up database replication on the primary VCX server. See Set Up Database Replication.

Upgrading the Primary VCX Server

Follow the steps in this section to upgrade the primary VCX server.

1. To start the upgrade process, enter these commands on the primary VCX server:

   ```
   cd /opt/installtemp
   tar xvf vcx-all-7.0.xc.tar
   cd upgrade-7.0.xc
   ./install-upgrade
   ```

   The system may prompt you to confirm that a new operating system version will be installed and indicates which disk partition will be used after the upgrade. If you see such a prompt, answer **y.**

   The system displays several status messages. The last two messages are:

```
------------------- Installation Completed Successfully -------------------
------------------- VCX version 7.0.xc is now available -------------------
```

2. Obtain a license key for the server. See Obtaining a License Key File.
3. Install the license key. See Installing a License Key File.
4. Switch to the new software version by entering the following command:

   ```
   vcx-switchversion 7.0.xc
   ```

   The system displays several status messages and then reboots. After the the reboot process has been completed, the system starts VCX 7.0.*x* services.

5. After the system has completed the restart process, verify that the upgrade has occurred by entering this command:

   ```
   ls -l /opt/3com/VCX
   ```

   The symbolic link (VCX) should point to the new version of the VCX software (7.0.*x*c).

   Example Output

```
/opt/3com/VCX -> /opt/3com/VCX.7.0.xc
```

6 Stop the Authentication and Directory service by entering the following commands:

```
cd /opt/3com/VCX/scripts/rc3.d
./S20vcxdata stop
```

7 Stop IP Messaging. When the primary VCX server reboots, IP Messaging restarts and must be stopped before you can upgrade the secondary VCX server. However, you should ensure IP Messaging is fully active before stopping it. To check IP Messaging status, enter the following commands:

```
su - app
cd /opt/3com/VCX/UMS/vcx-scripts/init.d
./vcxums status
```

8 If the returned status is `...running...`, stop IP Messaging by entering the following commands:

```
exit
cd /opt/3com/VCX/scripts/rc3.d
./S60ums stop
```

Upgrading the Secondary VCX Server

Follow the steps in this section to upgrade the secondary VCX server.

1 To start the upgrade process, enter these commands on the secondary VCX server:

```
cd /opt/installtemp
tar xvf vcx-all-7.0.xc.tar
cd upgrade-7.0.xc
./install-upgrade
```

The system may prompt you to confirm that a new operating system version will be installed and indicates which disk partition will be used after the upgrade. If you see such a prompt, answer **y.**

The system displays several status messages. The last two messages are:

```
------------------- Installation Completed Successfully -------------------
------------------- VCX version 7.0.xc is now available -------------------
```

2 Obtain a license key for the server. See Obtaining a License Key File.

3 Install the license key. See Installing a License Key File.

4 Switch to the new software version by entering the following command:

```
vcx-switchversion 7.0.xc
```

The system displays several status messages and then reboots. After the the reboot process has been completed, the system starts VCX 7.0.*x* services.

5 After the system has completed the restart process, verify that the upgrade has occurred by entering this command:

```
ls -l /opt/3com/VCX
```

The symbolic link (VCX) should point to the new version of the VCX software (7.0.*x*c).

Example Output

```
/opt/3com/VCX -> /opt/3com/VCX.7.0.xc
```

6 Stop the Authentication and Directory service by entering the following commands:

```
cd /opt/3com/VCX/scripts/rc3.d
./S20vcxdata stop
```

Set Up Database Replication

Follow the steps in this section to set up database replication.

1 Stop the Tomcat process, first on the primary VCX server and then on the secondary VCX server by entering these commands:

```
cd /opt/3com/VCX/scripts/rc3.d
./S70tomcat stop
```

2 Set up replication on the primary VCX server by entering these commands:

```
cd /opt/3com/VCX/vcxdata/bin
su cworks
./setupReplication
```

The replication setup script starts. Follow these steps:

a The `Enter the VCX Site Identification i.e. Site Id` prompt appears.

Enter site ID configured for this system. For single-site systems, the site ID is identical for both the primary VCX server and the secondary VCX server.

b The `Enter the Number of MASTER SITEs other than the MASTER DEFINITION SITE` [1]: prompt appears.

Press *Enter* to accept the default.

c The `Enter the MASTER DEFINITION SITE IP Address [IP address]` prompt appears.

Enter the IP address of the Master Definition site or press *Enter* if the displayed address is correct. This is typically the IP address of the primary VCX server.

d The `Enter the MASTER SITE 1 IP Address [0.0.0.0]` prompt appears.

Enter the IP address of the Master Site. This is typically the IP address of the secondary VCX server.

e The `Do you want to continue with the above settings? [n/y]:` prompt appears.

Enter **`y`** to continue. The script executes.

During script execution, messages appear describing the replication setup. Messages also appear stating that firewall setup should allow communication between the primary VCX server and the secondary VCX server. These messages are a reminder—firewall setup was performed during VCX software installation.

f The `Have you executed the ABOVE mentioned VCX-FIREWALL steps? [y/n]:` prompt appears.

Enter **`y`** to continue. The script executes.

When the replication is complete, *Multi-Master Replication Status* is reported as *NORMAL*. Do not continue to the next step until the replication is complete. Note that replication can take approximately 20 minutes to complete.

g You can check the replication by entering the following command:

```
./checkReplication
```

3 When the replication is complete, enter the following command to exit the *cworks* account and return to the *root* account:

```
exit
```

4 Start the Authentication and Directory service on the primary VCX server and the secondary VCX server by entering the following commands:

```
cd /opt/3com/VCX/scripts/rc3.d
./S20vcxdata start
```

5 Start the Tomcat process on the primary VCX server and the secondary VCX server by entering the following command:

```
./S70tomcat start
```

6 Start IP Messaging on the primary VCX server by entering the following command:

```
./S60ums start
```

Run the `admincfg` script on both the primary VCX server and the secondary VCX server. See Post-Upgrade Requirements.

Upgrading a Single-Site System With Four Servers

Single-site VCX systems can have either two servers or four servers.

- In a two-server configuration, each server runs IP Telephony server software and IP Messaging server software.
- In a four-server configuration, one pair of servers runs IP Telephony server software; the second pair of servers runs IP Messaging server software.

Follow the procedures in this section to upgrade the four-server configuration at a single site from VCX software 6.0. to version 7.0.

All upgrade commands are executed locally at the console.

Before you begin the upgrade procedures on the four servers, perform these steps.:

1 Log in as *root* on the primary IP Telephony server and on the secondary IP Telephony server.

2 Stop the Tomcat process, first on the primary IP Telephony server and then on the secondary IP Telephony server by entering these commands:

```
cd /opt/3com/VCX/scripts/rc3.d
./S70tomcat stop
```

3 Drop database replication on the primary IP Telephony server by entering these commands:

```
cd /opt/3com/VCX/vcxdata/bin
su cworks
./dropReplication
```

The drop replication script starts. Follow these steps:

a The `Enter the VCX Site Identification i.e. Site Id` prompt appears.

Enter site ID configured for this system. For single-site systems, the site ID is identical for both the primary IP Telephony server and the secondary IP Telephony server.

b The `Enter the Number of MASTER SITEs other than the MASTER DEFINITION SITE [1]:` prompt appears.

Press *Enter* to accept the default.

c The `Enter the MASTER DEFINITION SITE IP Address [`*`IP address`*`]` prompt appears.

Enter the IP address of the Master Definition site or press *Enter* if the displayed address is correct. This is typically the IP address of the primary IP Telephony server.

d The `Enter the MASTER SITE 1 IP Address [0.0.0.0]` prompt appears.

Enter the IP address of the Master Site. This is typically the IP address of the secondary IP Telephony server.

e The `Do you want to continue with the above settings? [n/y]:` prompt appears.

Enter **`y`** to continue. The script executes.

4 Enter the following command to exit the *cworks* account and return to the *root* account:

```
exit
```

5 Stop IP Messaging, first on the primary IP Messaging server and then on the secondary IP Messaging server by entering these commands:

```
cd /opt/3com/VCX/scripts/rc3.d
./S60ums stop
```

6 Obtain a copy of the `vcx-softswitch-7.0.xc.tar` software upgrade file and place it in the `/opt/installtemp` directory on the primary IP Telephony server and on the secondary IP Telephony server. The variable *`x`* indicates the version of VCX software (for example, `vcx-all-7.0.3c.tar`) that will replace version 6.0. The letter `c` is always appended to the version number.

7 Obtain a copy of the `vcx-ipmsg-7.0.xc.tar` software upgrade file and place it in the `/opt/installtemp` directory on the primary IP Messaging server and on the secondary IP Messaging server.

Next, execute the following steps in the order listed:

- Upgrade the primary IP Telephony server. See Upgrading the Primary IP Telephony Server.
- Upgrade the primary IP Messaging server. See Upgrading the Primary IP Messaging Server.
- Upgrade the secondary IP Telephony server. See Upgrading the Secondary IP Telephony Server.
- Upgrade the primary IP Messaging server. See Upgrading the Secondary IP Messaging Server.
- Set up database replication on the primary IP Telephony server. See Set Up Database Replication.

Upgrading the Primary IP Telephony Server

Follow the steps in this section to upgrade the primary IP Telephony server.

1. To start the upgrade process, enter these commands on the primary IP Telephony server:

   ```
   cd /opt/installtemp
   tar xvf vcx-softswitch-7.0.xc.tar
   cd upgrade-7.0.xc
   ./install-upgrade
   ```

   The system may prompt you to confirm that a new operating system version will be installed and indicates which disk partition will be used after the upgrade. If you see such a prompt, answer **y.**

   The system displays several status messages. The last two messages are:

```
------------------- Installation Completed Successfully -------------------
------------------- VCX version 7.0.xc is now available -------------------
```

2. Obtain a license key for the server. See Obtaining a License Key File.
3. Install the license key. See Installing a License Key File.
4. Switch to the new software version by entering the following command:

   ```
   vcx-switchversion 7.0.xc
   ```

   The system displays several status messages and then reboots. After the the reboot process has been completed, the system starts VCX 7.0.x IP Telephony services.

5 After the system has completed the restart process, verify that the upgrade has occurred by entering this command:

```
ls -l /opt/3com/VCX
```

The symbolic link (VCX) should point to the new version of the VCX software (7.0.xc).

Example Output

```
/opt/3com/VCX -> /opt/3com/VCX.7.0.xc
```

6 Stop the Authentication and Directory service by entering the following commands:

```
cd /opt/3com/VCX/scripts/rc3.d
./S20vcxdata stop
```

Upgrading the Primary IP Messaging Server

Follow the steps in this section to upgrade the primary IP Messaging server.

1 To start the upgrade process, enter these commands on the primary IP Messaging server:

```
cd /opt/installtemp
tar xvf vcx-ipmsg-7.0.xc.tar
cd upgrade-7.0.xc
./install-upgrade
```

The system may prompt you to confirm that a new operating system version will be installed and indicates which disk partition will be used after the upgrade. If you see such a prompt, answer **y.**

The system displays several status messages. The last two messages are:

```
------------------- Installation Completed Successfully -------------------
------------------- VCX version 7.0.xc is now available -------------------
```

2 Obtain a license key for the server. See Obtaining a License Key File.

3 Install the license key. See Installing a License Key File.

4 Switch to the new software version by entering the following command:

```
vcx-switchversion 7.0.xc
```

5 Specify whether this IP Messaging system will support IP Messaging clients. The upgrade script displays the following prompt:

```
Will this system support IPMSG client systems? [N]:
```

IP Messaging can be deployed in a client/server configuration to support more users and distribute services.

- If you enter **N**, this system will be configured as the primary IP Messaging server and no client configuration prompts will appear.
- If you enter **Y**, this system will be configured as an IP Messaging server and you will be asked to identify the IP Messaging clients associated with this server. The following prompts appear:

```
A list of each of the IPMSG client systems' IP addresses
and hostnames is required. Enter a blank input to
indicate that all clients have been entered.

IP address of IPMSG client 1

Client IP Address:
```

a Enter the IP address of the first IP Messaging client system.

The following prompts appear:

```
Hostname of IPMSG client 1

Client Hostname:
```

b Enter the hostname of the first IP Messaging client system.

You can identify 20 IP Messaging client systems. The client configuration prompts appear until you reach the maximum (20 entries) or until you press *Enter* without entering a IP address.

When you finish identifying IP Messaging client systems, the following prompt appears:

```
Do you wish to change any of the IP Messaging
Service parameters? [N]:
```

c Press *Enter* to accept the default answer (**N**). If you enter **Y**, the script presents each of the items that you entered and allows you to accept the value or change it.

The system reboots. After the reboot process has been completed, the system starts VCX 7.0.*x* IP Messaging services.

6 After the system has completed the restart process, verify that the upgrade has occurred by entering this command:

```
ls -l /opt/3com/VCX
```

The symbolic link (VCX) should point to the new version of the VCX software (7.0.*x*c).

Example Output

```
/opt/3com/VCX -> /opt/3com/VCX.7.0.xc
```

7 Stop IP Messaging. When the primary IP Messaging reboots, IP Messaging restarts and must be stopped before you can upgrade the secondary IP Messaging server. However, you should ensure IP Messaging is fully active before stopping it. To check IP Messaging status, enter the following commands:

```
su - app
cd /opt/3com/VCX/UMS/vcx-scripts/init.d
./vcxums status
```

8 If the returned status is `...running...`, stop IP Messaging by entering the following commands:

```
exit
cd /opt/3com/VCX/scripts/rc3.d
./S60ums stop
```

Upgrading the Secondary IP Telephony Server

Follow the steps in this section to upgrade the secondary IP Telephony server.

1 To start the upgrade process, enter these commands on the secondary IP Telephony server:

```
cd /opt/installtemp
tar xvf vcx-softswitch-7.0.xc.tar
cd upgrade-7.0.xc
./install-upgrade
```

The system may prompt you to confirm that a new operating system version will be installed and indicates which disk partition will be used after the upgrade. If you see such a prompt, answer **y.**

The system displays several status messages. The last two messages are:

```
------------------- Installation Completed Successfully -------------------
------------------- VCX version 7.0.xc is now available -------------------
```

2 Obtain a license key for the server. See Obtaining a License Key File.

3 Install the license key. See Installing a License Key File.

4 Switch to the new software version by entering the following command:

```
vcx-switchversion 7.0.xc
```

The system displays several status messages and then reboots. After the the reboot process has been completed, the system starts VCX 7.0.*x* IP Telephony services.

5 After the system has completed the restart process, verify that the upgrade has occurred by entering this command:

```
ls -l /opt/3com/VCX
```

The symbolic link (VCX) should point to the new version of the VCX software (7.0.*xc*).

Example Output

```
/opt/3com/VCX -> /opt/3com/VCX.7.0.xc
```

6 Stop the Authentication and Directory service by entering the following commands:

```
cd /opt/3com/VCX/scripts/rc3.d
./S20vcxdata stop
```

Upgrading the Secondary IP Messaging Server

Follow the steps in this section to upgrade the secondary IP Messaging server.

1 To start the upgrade process, enter these commands on the secondary IP Messaging server:

```
cd /opt/installtemp
tar xvf vcx-ipmsg-7.0.xc.tar
cd upgrade-7.0.xc
./install-upgrade
```

The system may prompt you to confirm that a new operating system version will be installed and indicates which disk partition will be used after the upgrade. If you see such a prompt, answer **y.**

The system displays several status messages. The last two messages are:

```
------------------- Installation Completed Successfully -------------------
------------------- VCX version 7.0.xc is now available -------------------
```

2 Obtain a license key for the server. See Obtaining a License Key File.

3 Install the license key. See Installing a License Key File.

4 Switch to the new software version by entering the following command:

```
vcx-switchversion 7.0.xc
```

The system displays several status messages and then reboots. After the the reboot process has been completed, the system starts VCX 7.0.*x* IP Messaging services.

5 After the system has completed the restart process, verify that the upgrade has occurred by entering this command:

```
ls -l /opt/3com/VCX
```

The symbolic link (VCX) should point to the new version of the VCX software (7.0.*x*c).

Example Output

```
/opt/3com/VCX -> /opt/3com/VCX.7.0.xc
```

Set Up Database Replication

Follow the steps in this section to set up database replication.

1 Stop the Tomcat process, first on the primary IP Telephony server and then on the secondary IP Telephony server by entering these commands (log in as *root*):

```
cd /opt/3com/VCX/scripts/rc3.d
./S70tomcat stop
```

2 Set up replication on the primary IP Telephony server by entering these commands:

```
cd /opt/3com/VCX/vcxdata/bin
su cworks
./setupReplication
```

The replication setup script starts. Follow these steps:

a The `Enter the VCX Site Identification i.e. Site Id` prompt appears.

Enter site ID configured for this system. For single-site systems, the site ID is identical for both the primary IP Telephony server and the secondary IP Telephony server.

b The `Enter the Number of MASTER SITEs other than the MASTER DEFINITION SITE` [1]: prompt appears.

Press *Enter* to accept the default.

c The `Enter the MASTER DEFINITION SITE IP Address [`*`IP address`*`]` prompt appears.

Enter the IP address of the Master Definition site or press *Enter* if the displayed address is correct. This is typically the IP address of the primary IP Telephony server.

d The `Enter the MASTER SITE 1 IP Address [0.0.0.0]` prompt appears.

Enter the IP address of the Master Site. This is typically the IP address of the secondary IP Telephony server.

e The `Do you want to continue with the above settings? [n/y]:` prompt appears.

Enter **`y`** to continue. The script executes.

During script execution, messages appear describing the replication setup. Messages also appear stating that firewall setup should allow communication between the primary IP Telephony server and the secondary IP Telephony server. These messages are a reminder—firewall setup was performed during VCX software installation.

f The `Have you executed the ABOVE mentioned VCX-FIREWALL steps? [y/n]:` prompt appears.

Enter **`y`** to continue. The script executes.

When the replication is complete, *Multi-Master Replication Status* is reported as *NORMAL*. Do not continue to the next step until the replication is complete. Note that replication can take approximately 20 minutes to complete.

g You can check the replication by entering the following command:

```
./checkReplication
```

3 When the replication is complete, enter the following command to exit the *cworks* account and return to the *root* account:

```
exit
```

4 Start the Authentication and Directory service on the primary IP Telephony server and the secondary IP Telephony server by entering the following commands:

```
cd /opt/3com/VCX/scripts/rc3.d
./S20vcxdata start
```

5 Start the Tomcat process on the primary IP Telephony server and the secondary IP Telephony server by entering the following command:

```
./S70tomcat start
```

6 Start IP Messaging on the primary IP Messaging server by entering the following command:

```
./S60ums start
```

Run the `admincfg` script on both the primary VCX server and the secondary VCX server. See Post-Upgrade Requirements.

Upgrading a Multi-Site System With No Branch Offices

Some VCX multi-site systems have regional offices but no branch offices. Each regional office contains a primary VCX server and a secondary VCX server. These servers perform call processing and IP Messaging tasks. One of the regional offices also contains a Call Records server which gathers call records from each of the regional offices.

- To upgrade the primary VCX server and the secondary VCX server, follow the instructions in Upgrading a Single-Site System With Two Servers earlier in this appendix.
- To upgrade the Call Records server, see the following section, Upgrading the Call Records Server.

All upgrade commands are executed locally at the console.

Upgrading the Call Records Server

To upgrade the Call Records server:

1 Log in to the Call Records server as *root*.

2 Stop all VCX processes on the Call Records server by entering the following commands:

```
cd /etc/init.d
./vcx stop
```

3 Obtain a copy of the `vcx-bss-7.0.xc.tar` software upgrade file and place it in the `/opt/installtemp` directory on the Call Records server.

4 Enter these commands:

```
cd /opt/installtemp
tar xvf vcx-bss-7.0.xc.tar
cd upgrade-7.0.xc
./install-upgrade
```

The system may prompt you to confirm that a new operating system version will be installed and indicates which disk partition will be used after the upgrade. If you see such a prompt, answer **y.**

The system displays several status messages. The last two messages are:

```
------------------- Installation Completed Successfully -------------------
------------------- VCX version 7.0.xc is now available -------------------
```

5 Obtain a license key for the server. See Obtaining a License Key File.

6 Install the license key. See Installing a License Key File.

7 Change to the new software version by entering this command:

`vcx-switchversion 7.0.xc`

The system displays several status messages and then reboots. When the reboot process has been completed, the system starts VCX 7.0.*x*c services.

8 After the system has completed the restart process, verify that the upgrade has occurred by entering the following command:

`ls -l /opt/3com/VCX`

The symbolic link (VCX) should point to the new version of the VCX software (7.0.*x*c).

Example Output: `/opt/3com/VCX -> /opt/3com/VCX.7.0.xc`

Upgrading a Multi-Site VCX System with Branch Offices

Some multi-site VCX systems have regional offices and branch offices. Each branch office is associated with a regional office.

Multi-site VCX systems can be categorized by the method used to implement messaging.

- In a multi-site VCX system configured to use *local* messaging, the IP Messaging server is co-located with the IP Telephony server at each branch office. In this case, each branch office provides messaging services for its users.
- In a multi-site VCX system configured to use *global* messaging, the IP Messaging server is located on the regional office. Each branch office runs the IP Telephony server only. In this case, the regional office provides messaging services for users at each branch office.

Follow the procedures in this section to upgrade a multi-site VCX system from version 6.0 to 7.0. The components in a multi-site VCX system can be set up in many possible configurations. The procedures in this section are based on a multi-site VCX system that includes two regions (Region 1

and Region 2) with multiple branch offices in each region. The procedures describe the upgrade process for both local and global messaging.

All upgrade commands are executed locally at the console.

When upgrading a region-to-region office configuration, you must drop replication between the Authentication and Directory server in each region.

***CAUTION**: When upgrading a multi-site VCX system, upgrade the regional servers before upgrading the branch servers. If you upgrade the branch servers first, the database schema on the branches may not match the schema version on the region causing database replication failure.*

Multi-Site VCX System Upgrade Order

When upgrading a multi-site VCX system configuration, upgrade the components in the following order:

- Upgrade the replicated Authentication and Directory servers in each regional office.
- Upgrade the IP Messaging servers in each regional office.
- Upgrade the Call servers in each regional office.
- Upgrade the Call Records server (optional).
- Upgrade the branch offices hosted by a region.

Upgrading the Regional Authentication and Directory Servers

This section describes how to upgrade the Authentication and Directory servers in Region 1 and Region 2.

To upgrade the Authentication and Directory servers in a two-region VCX system:

1. Log in, as *root*, to the Call servers in each region. A typical configuration includes a primary Call server and secondary Call server in each region.
2. Stop the Tomcat process, first on the primary Call server and then on the secondary Call server in each region by entering the following commands:

   ```
   cd /opt/3com/VCX/scripts/rc3.d
   ./S70tomcat stop
   ```

3. Log in, as *root*, to the Authentication and Directory server in Region 1.

4 Stop database replication by entering the following commands:

```
cd /opt/3com/VCX/vcxdata/bin
su cworks
./dropReplication
```

The drop replication script starts. Follow these steps:

a The `Enter the VCX Site Identification i.e. Site Id` prompt appears.

Enter site ID configured for this system.

b The `Enter the Number of MASTER SITEs other than the MASTER DEFINITION SITE:` prompt appears.

Enter the number of Master sites. To determine the number of Master Sites associated with this office, use the *listVcxdata* command. See Manually Configuring Replication for an IP Telephony Server or IP Telephony and Messaging Server for more information.

c The `Enter the MASTER DEFINITION SITE IP Address [`*`IP address`*`]` prompt appears.

Enter the IP address of the Master Definition site.

d The `Enter the MASTER SITE 1 IP Address [0.0.0.0]` prompt appears.

Enter the IP address of the Master Site. If there are more than one Master Sites, this question repeats until the number of master sites specified in step **b** is reached.

e The `Do you want to continue with the above settings? [n/y]:` prompt appears.

Enter **`y`** to continue. The script executes.

5 Enter the following command to exit the *cworks* account and return to the *root* account:

```
exit
```

6 Obtain a copy of the `vcx-dataserver-7.0.xc.tar` software upgrade file and place it in the `/opt/installtemp` directory on the Authentication and Directory server. The variable *x* indicates the version of VCX software (for example, `vcx-all-7.0.3c.tar`) that will replace version 6.0. The letter `c` is always appended to the version number.

7 Enter these commands:

```
cd /opt/installtemp
tar xvf vcx-dataserver-7.0.xc.tar
cd upgrade-7.0.x
./install-upgrade
```

The system may prompt you to confirm that a new operating system version will be installed and indicates which disk partition will be used after the upgrade. If you see such a prompt, answer **y.**

The system displays several status messages. The last two messages are:

```
------------------- Installation Completed Successfully -------------------
------------------- VCX version 7.0.xc is now available -------------------
```

8 Obtain a license key for the server. See Obtaining a License Key File.

9 Install the license key. See Installing a License Key File.

10 Change to the new software version by entering this command:

```
vcx-switchversion 7.0.xc
```

The system displays several status messages and then reboots. When the reboot process has been completed, the system starts VCX 7.0.*x*c Authentication and Directory service.

11 After the system has completed the restart process, verify that the upgrade has occurred by entering the following command:

```
ls -l /opt/3com/VCX
```

The symbolic link (VCX) should point to the new version of the VCX software (7.1.*x*c).

Example Output: `/opt/3com/VCX -> /opt/3com/VCX.7.0.xc`

12 Enter the following commands to stop the Authentication and Directory server on Region 1:

```
cd /opt/3com/VCX/scripts/rc3.d
./S20vcxdata stop
```

13 Log in, as *root*, to the Authentication and Directory server in Region 2.

14 Stop database replication by entering the following commands:

```
cd /opt/3com/VCX/vcxdata/bin
su cworks
./dropReplication
```

The drop replication script starts. Follow the procedure described in step 4.

15 Enter the following command to exit the *cworks* account and return to the *root* account:

```
exit
```

16 Obtain a copy of the `vcx-dataserver-7.0.xc.tar` software upgrade file and place it in the `/opt/installtemp` directory on the Authentication and Directory server. The variable *x* indicates the version of VCX software (for example, `vcx-dataserver-7.0.3c.tar)` that will replace version 6.0. The letter `c` is always appended to the version number.

17 Enter these commands:

```
cd /opt/installtemp
tar xvf vcx-dataserver-7.0.xc.tar
cd upgrade-7.0.x
./install-upgrade
```

The system may prompt you to confirm that a new operating system version will be installed and indicates which disk partition will be used after the upgrade. If you see such a prompt, answer **y.**

The system displays several status messages. The last two messages are:

```
------------------- Installation Completed Successfully -------------------
------------------- VCX version 7.0.xc is now available -------------------
```

18 Obtain a license key for the server. See Obtaining a License Key File.

19 Install the license key. See Installing a License Key File.

20 Change to the new software version by entering this command:

```
vcx-switchversion 7.0.xc
```

The system displays several status messages and then reboots. When the reboot process has been completed, the system starts VCX 7.0.*x*c Authentication and Directory service.

21 After the system has completed the restart process, verify that the upgrade has occurred by entering the following command:

```
ls -l /opt/3com/VCX
```

The symbolic link (VCX) should point to the new version of the VCX software (7.0.*x*c).

Example Output: `/opt/3com/VCX -> /opt/3com/VCX.7.0.xc`

22 Enter the following commands to stop the Authentication and Directory server on Region 2:

```
cd /opt/3com/VCX/scripts/rc3.d
./S20vcxdata stop
```

At this point, you have upgraded the Authentication and Directory server on Region 1 and Region 2, and you have stopped database replication in both regions. The following steps upgrade the databases in each region, set up replication in each region, and restart the Authentication and Directory server in each region. You should still be logged in, as *root*, in each region.

1 On the Authentication and Directory server in Region 1, upgrade the Region 2 database by entering the following commands:

```
su - cworks
cd /opt/3com/VCX/vcxdata/bin
./upgradeVcxdata
```

The `Enter the VCX Site Identification i.e. Site Id:` prompt appears.

2 Enter the Site ID for Region 2.

3 On the Authentication and Directory server in Region 2, upgrade the Region 1 database by entering the following commands:

```
su - cworks
cd /opt/3com/VCX/vcxdata/bin
./upgradeVcxdata
```

The `Enter the VCX Site Identification i.e. Site Id:` prompt appears.

4 Enter the Site ID for Region 1.

5 Set up database replication on Region 1 by entering the following commands (you should still be logged in to the Authentication and Directory server as *cworks*):

```
cd /opt/3com/VCX/vcxdata/bin
./setupReplication
```

The replication setup script starts. Follow these steps:

a The `Enter the VCX Site Identification i.e. Site Id` prompt appears.

Enter site ID configured for this system.

b The `Enter the Number of MASTER SITEs other than the MASTER DEFINITION SITE:` prompt appears.

Enter the number of Master sites. To determine the number of Master Sites associated with this office, use the *listVcxdata* command. See

Manually Configuring Replication for an IP Telephony Server or IP Telephony and Messaging Server for more information.

c The `Enter the MASTER DEFINITION SITE IP Address [IP address]` prompt appears.

Enter the IP address of the Master Definition site.

d The `Enter the MASTER SITE 1 IP Address [0.0.0.0]` prompt appears.

Enter the IP address of the Master Site. If there are more than one Master Sites, this question repeats until the number of master sites specified in step **b** is reached.

e The `Do you want to continue with the above settings? [n/y]:` prompt appears.

Enter **`y`** to continue. The script executes.

When the replication is complete, *Multi-Master Replication Status* is reported as *NORMAL*. Do not continue to the next step on this server until the replication is complete. Note that replication can take approximately 20 minutes to complete.

f You can check the replication by entering the following command:

```
./checkReplication
```

6 Set up database replication on Region 2 by entering the following commands (you should still be logged in to the Authentication and Directory server as *cworks*):

```
cd /opt/3com/VCX/vcxdata/bin
./setupReplication
```

The replication setup script starts. Follow the procedure described in step 5.

7 Once replication is complete and status is *NORMAL* on Region 1 and Region 2, start the Authentication and Directory servers in each region by entering the following commands while logged in as *root*:

```
cd /opt/3com/VCX/scripts/rc3.d
./S20vcxdata start
```

8 Start the Tomcat process on the primary Call server and the secondary Call server in each region by entering the following commands:

```
cd /opt/3com/VCX/scripts/rc3.d
./S70tomcat start
```

Upgrading the Regional IP Messaging Servers

This section describes how to upgrade regional IP Messaging servers. These servers may provide messaging services for users connected to the regional office (local messaging). Or, the servers may provide messaging services for users connected to the regional office and to users connected to one or more supported branch offices (global messaging). In either case, you need to perform the steps in this section on a console attached to each IP Messaging server in all regions (Region 1 and Region 2 in this example).

IP Messaging servers are typically configured in pairs, with one server acting as the primary and the other acting as the secondary. The primary IP Messaging server and a secondary IP Messaging server may be located in the same region or in different regions.

To upgrade the IP Messaging servers:

1. Stop the primary IP Messaging server and a secondary IP Messaging server by entering the following commands, as *root*, on each server:

   ```
   cd /opt/3com/VCX/scripts/rc3.d
   ./S60ums stop
   ```

2. Obtain a copy of the `vcx-ipmsg-7.0.xc.tar` software upgrade file and place it in the `/opt/installtemp` directory on the primary IP Messaging server and on the secondary IP Messaging server.

3. Upgrade the primary IP Messaging server by following these steps:

   a. Start the upgrade process by entering the following commands:

      ```
      cd /opt/installtemp
      tar xvf vcx-ipmsg-7.0.xc.tar
      cd upgrade-7.0.xc
      ./install-upgrade
      ```

      The system may prompt you to confirm that a new operating system version will be installed and indicates which disk partition will be used after the upgrade. If you see such a prompt, answer **y.**

      The system displays several status messages. The last two messages are:

```
------------------- Installation Completed Successfully -------------------
------------------- VCX version 7.0.xc is now available -------------------
```

   b. Obtain a license key for the server. See Obtaining a License Key File.

   c. Install the license key. See Installing a License Key File.

d Switch to the new software version by entering the following command:

```
vcx-switchversion 7.0.xc
```

e Specify whether this IP Messaging system will support IP Messaging clients. The upgrade script displays the following prompt for the primary IP Messaging server only:

```
Will this system support IPMSG client systems? [N]:
```

IP Messaging can be deployed in a client/server configuration to support more users and distribute services.

- If you enter **N**, this system will be configured as the primary IP Messaging server and no client configuration prompts will appear.
- If you enter **Y**, this system will be configured as the primary IP Messaging server and you will be asked to identify the IP Messaging clients associated with this server. The following prompts appear:

```
A list of each of the IPMSG client systems' IP addresses
and hostnames is required. Enter a blank input to
indicate that all clients have been entered.

IP address of IPMSG client 1

Client IP Address:
```

f Enter the IP address of the first IP Messaging client system.

The following prompts appear:

```
Hostname of IPMSG client 1

Client Hostname:
```

g Enter the hostname of the first IP Messaging client system.

You can identify 20 IP Messaging client systems. The client configuration prompts appear until you reach the maximum (20 entries) or until you press *Enter* without entering a IP address.

When you finish identifying IP Messaging client systems, the following prompt appears:

```
Do you wish to change any of the IP Messaging
Service parameters? [N]:
```

h Press *Enter* to accept the default answer (**N**). If you enter **Y**, the script presents each of the items that you entered and allows you to accept the value or change it.

The system reboots. After the reboot process has been completed, the system starts VCX 7.0.*x* IP Messaging services.

i After the system has completed the restart process, verify that the upgrade has occurred by entering this command:

```
ls -l /opt/3com/VCX
```

The symbolic link (VCX) should point to the new version of the VCX software (7.0.*x*c).

Example Output

```
/opt/3com/VCX -> /opt/3com/VCX.7.0.xc
```

4 Upgrade the secondary IP Messaging server by following the procedure described in step 3. However, unlike the primary IP Messaging server upgrade, the system will *not* prompt you about support for IP Messaging clients. If the primary IP Messaging server was configured with the client information, the secondary IP Messaging server is automatically configured with this information.

Upgrading the Regional Call Servers

This section describes how to upgrade regional Call servers. Call servers are typically installed in redundant pairs (primary and secondary) in a multi-site VCX system. You need to perform the steps in this section on a console attached to each Call server in all regions (Region 1 and Region 2 in this example).

To upgrade the Call servers:

1 Log on, as *root*, to the primary Call server and the secondary Call server in a region.

2 Obtain a copy of the `vcx-callserver-7.0.xc.tar` software upgrade file and place it in the `/opt/installtemp` directory on the primary Call server and on the secondary Call server.

3 Upgrade the primary Call server by following these steps:

a Start the upgrade process by entering the following commands:

```
cd /opt/installtemp
tar xvf vcx-callserver-7.0.xc.tar
cd upgrade-7.0.xc
./install-upgrade
```

The system may prompt you to confirm that a new operating system version will be installed and indicates which disk partition will be used after the upgrade. If you see such a prompt, answer **y.**

The system displays several status messages. The last two messages are:

```
------------------- Installation Completed Successfully -------------------
------------------- VCX version 7.0.xc is now available -------------------
```

b Obtain a license key for the server. See Obtaining a License Key File.

c Install the license key. See Installing a License Key File.

d Switch to the new software version by entering the following command:

```
vcx-switchversion 7.0.xc
```

The system displays several status messages and then reboots. After the reboot process has been completed, the system starts VCX 7.0.*x* Call server.

e After the system has completed the restart process, verify that the upgrade has occurred by entering this command:

```
ls -l /opt/3com/VCX
```

The symbolic link (VCX) should point to the new version of the VCX software (7.0.*xc*).

Example Output

```
/opt/3com/VCX -> /opt/3com/VCX.7.0.xc
```

4 Upgrade the secondary Call server by following the procedure described in step 3.

5 Repeat steps for the other regions in your VCX system.

Upgrading the Regional Call Records Server

This section describes how to upgrade regional Call Records server. In a multi-site VCX system, a single Call server typically supports all regional offices. You need to perform the steps in this section on a console attached to the regional Call server.

To upgrade the Call Records server:

1 Log in to the Call Records server as *root*.

2 Obtain a copy of the `vcx-bss-7.0.xc.tar` software upgrade file and place it in the `/opt/installtemp` directory on the Call Records server.

3 Enter these commands:

```
cd /opt/installtemp
tar xvf vcx-bss-7.0.xc.tar
cd upgrade-7.0.xc
./install-upgrade
```

The system may prompt you to confirm that a new operating system version will be installed and indicates which disk partition will be used after the upgrade. If you see such a prompt, answer **y.**

The system displays several status messages. The last two messages are:

```
------------------- Installation Completed Successfully -------------------
------------------- VCX version 7.0.xc is now available -------------------
```

4 Obtain a license key for the server. See Obtaining a License Key File.

5 Install the license key. See Installing a License Key File.

6 Change to the new software version by entering this command:

```
vcx-switchversion 7.0.xc
```

The system displays several status messages and then reboots. When the reboot process has been completed, the system starts VCX 7.0.*xc* services.

7 After the system has completed the restart process, verify that the upgrade has occurred by entering the following command:

```
ls -l /opt/3com/VCX
```

The symbolic link (VCX) should point to the new version of the VCX software (7.0.*xc*).

Example Output: `/opt/3com/VCX -> /opt/3com/VCX.7.0.xc`

Upgrading the Branch Offices

This section describes how to upgrade branch offices. Each branch office is associated with a regional office.

As noted in Upgrading a Multi-Site VCX System with Branch Offices, multi-site VCX systems can be categorized by the method used to implement messaging.

- In a multi-site VCX system configured to use *local* messaging, the IP Messaging server is co-located with the IP Telephony server at each branch office. In this case, each branch office provides messaging services for its users.

- In a multi-site VCX system configured to use *global* messaging, the IP Messaging server is located on the regional office. Each branch office runs the IP Telephony server only. In this case, the regional office provides messaging services for users at each branch office.

The procedures in this section are based on a multi-site VCX system that includes two regions (Region 1 and Region 2). For this example system, the branches in Region 1 use local messaging, and the branches in Region 2 use global messaging.

All upgrade commands are executed locally at the console.

***CAUTION**: When upgrading a multi-site VCX system, upgrade the regional servers before upgrading the branch servers. If you upgrade the branch servers first, the database schema on the branches may not match the schema version on the region causing database replication failure.*

To upgrade the branch offices in Region 1 (local messaging):

1. Stop the Tomcat process on the Call servers in Region 1 by logging in to each server as *root* and executing the following commands:

   ```
   cd /opt/3com/VCX/scripts/rc3.d
   ./S70tomcat stop
   ```

2. Log in to the first branch office server as *root*.
3. Obtain a copy of the `vcx-all-7.0.xc.tar` software upgrade file and place it in the `/opt/installtemp` directory on the branch office server. The variable `x` indicates the version of VCX software (for example, `vcx-all-7.0.3c.tar`) that will replace version 6.0. The letter `c` is always appended to the version number.
4. To start the upgrade process, enter the following commands:

   ```
   cd /opt/installtemp
   tar xvf vcx-all-7.0.xc.tar
   cd upgrade-7.0.xc
   ./install-upgrade
   ```

   The system may prompt you to confirm that a new operating system version will be installed and indicates which disk partition will be used after the upgrade. If you see such a prompt, answer **y.**

   The system displays several status messages. The last two messages are:

```
------------------- Installation Completed Successfully -------------------
------------------- VCX version 7.0.xc is now available -------------------
```

5 Obtain a license key for the server. See Obtaining a License Key File.

6 Install the license key. See Installing a License Key File.

7 Switch to the new software version by entering the following command:

```
vcx-switchversion 7.0.xc
```

The system displays several status messages and then reboots. After the the reboot process has been completed, the system starts VCX 7.0.*x* services.

8 After the system has completed the restart process, verify that the upgrade has occurred by entering this command:

```
ls -l /opt/3com/VCX
```

The symbolic link (VCX) should point to the new version of the VCX software (7.0.*x*c).

Example Output

```
/opt/3com/VCX -> /opt/3com/VCX.7.0.xc
```

9 Repeat steps 2 through 8 for all the other branch office servers in Region 1.

10 After upgrading all the branches, restart the Tomcat process on the Call servers in Region 1 by logging in to each server as *root* and executing the following commands:

```
cd /opt/3com/VCX/scripts/rc3.d
./S70tomcat start
```

To upgrade the branch offices in Region 2 (global messaging):

1 Stop the Tomcat process on the Call servers in Region 2 by logging in to each server as *root* and executing the following commands:

```
cd /opt/3com/VCX/scripts/rc3.d
./S70tomcat stop
```

2 Log in to the first branch office server as *root*.

3 Obtain a copy of the `vcx-softswitch-7.0.xc.tar` software upgrade file and place it in the `/opt/installtemp` directory on the branch office server. The variable *x* indicates the version of VCX software (for example, `vcx-all-7.0.3c.tar`) that will replace version 6.0. The letter `c` is always appended to the version number.

4 To start the upgrade process, enter the following commands:

```
cd /opt/installtemp
tar xvf vcx-softswitch-7.0.xc.tar
cd upgrade-7.0.xc
./install-upgrade
```

The system may prompt you to confirm that a new operating system version will be installed and indicates which disk partition will be used after the upgrade. If you see such a prompt, answer **y.**

The system displays several status messages. The last two messages are:

```
------------------- Installation Completed Successfully -------------------
------------------- VCX version 7.0.xc is now available -------------------
```

5 Obtain a license key for the server. See Obtaining a License Key File.

6 Install the license key. See Installing a License Key File.

7 Switch to the new software version by entering the following command:

```
vcx-switchversion 7.0.xc
```

The system displays several status messages and then reboots. After the the reboot process has been completed, the system starts VCX 7.0.*x* services.

8 After the system has completed the restart process, verify that the upgrade has occurred by entering this command:

```
ls -l /opt/3com/VCX
```

The symbolic link (VCX) should point to the new version of the VCX software (7.0.*x*c).

Example Output

```
/opt/3com/VCX -> /opt/3com/VCX.7.0.xc
```

9 Repeat steps 2 through 8 for all the other branch office servers in Region 2.

10 After upgrading all the branches, restart the Tomcat process on the Call servers in Region 2 by logging in to each server as *root* and executing the following commands:

```
cd /opt/3com/VCX/scripts/rc3.d
./S70tomcat start
```

Be sure to run the admincfg script on each VCX server in the multi-site system that runs the Call Processing service (IP Telephony and Messaging

server, IP Telephony server, and Call Processing server). See Post-Upgrade Requirements.

D DOWNGRADING VCX SERVER SOFTWARE

This appendix describes the procedures you can perform to downgrade the VCX software running on your system to a previously installed version.

This chapter includes the following topics:

- Verifying Software Versions
- Downgrading from 7.1 to 7.0
- Downgrading from 7.1.y to 7.1.x
- Downgrading from 7.0 to 6.0

During a VCX system upgrade or downgrade, users cannot make calls within the system. However, users may be able to make emergency calls, or make calls to and receive calls from destinations outside of the VCX system (that is, the PSTN). This capability depends on the availability, configuration, and capacity of the media gateway (or gateways) set up in the VCX system. See the VCX Installation Guide *for information on configuring a fail-over call route point. Also refer to your gateway documentation.*

Verifying Software Versions

This section describes how to verify the software versions of individual components and entire releases.

Verifying Component Software Versions

To verify what the component software versions are:

1. Log onto the VCX system as *root*.
2. Navigate to */opt/3com/VCX/scripts*.
3. Enter this command:

   ./vcx-assemble --validate

   This lists all of the components and their software versions that comprise the current running assembly.

Verifying Release Software Version

To verify what the running release software version is:

1. Log onto the VCX system as *root*.
2. Enter the following commands:

   cd /opt/3com

   ls -l

   This command returns a list all of the installed releases and indicates the running VCX version. The running VCX version is preceded by a symbolic link icon (->).

```
lrwxrwxrwx 1 root root 21 Jan 13 09:13 VCX -> /opt/3com/VCX.7.0.1c
drwxr-xr-x   10 root root 4096 Jan 10 07:13 VCX.7.0.0c
```

   In this example, the link points to version 7.0.1c. The other listed release, 7.0.0c, is installed, but not running.

   For VCX systems running version 7.0 or higher, you can log in as *root* and enter the following command:

   vcx-listversions

   This command returns a list all of the installed releases and indicates the running VCX version.

```
7_0_10_11     2005-10-24    active
7_0_9_10      2005-10-18    installed
7_0_8_9       2005-10-10    installed
7_0_7_8       2005-09-20    installed
```

All components in a VCX system *must* run the same version of VCX software. This requirement has the following implications:

- You cannot upgrade or downgrade one component in a VCX system and not upgrade or downgrade the other system components.
- If you add a server to an existing VCX system (for example, a branch office), the VCX components on the new server must be installed with the same version of the VCX software as the existing components.

Downgrading from 7.1 to 7.0

Follow the procedures in this section to downgrade your VCX system from version 7.1 to 7.0.

Important Considerations

Before performing a downgrade, keep these considerations in mind:

- Downgrades are typically performed for one of the following reasons:
  - You have successfully upgraded your VCX system but want to revert to the previous version of VCX system software.
  - During a VCX system upgrade, one component fails to upgrade and want to revert to the previous version of VCX system software. If a component fails to upgrade, contact your 3Com Support for assistance before proceeding.
- To use the downgrade procedures in this section, your VCX system must have previously been successfully running version 7.1. The downgrade procedure does not "back-port" any configuration or database modifications you might have made while running version 7.1. Following this procedure restores the VCX system to the operational state it was in prior to the upgrade occurring.
- If an upgrade at a regional office is unsuccessful, contact your 3Com Support for assistance and downgrade the regional office servers. Do not upgrade any branch office servers that are associated with that regional office until the regional office upgrades are successful.
- The database schema version on a branch office server must match the schema version on the regional office Authentication and Directory server. After a successful upgrade of a regional office, if an upgrade of any branch office server is unsuccessful, contact your 3Com Support for assistance and downgrade that branch office server.

- The VCX system supports two operating system images. If the upgrade required installation of a new VCX operating system version, then the downgrade must revert to the previous installation.
- The person performing the downgrade should be trained in VCX operation and procedures, and be familiar with VCX terminology.
- This downgrade procedure assumes the VCX version 7.0 system databases were backed up before the upgrade to version 7.1 was performed. These version 7.0 backups will be restored as part of the downgrade procedure.

Note that the downgrade procedure does not remove VCX version 7.1 software from your VCX system.

Downgrading a Single-Site System (7.1 to 7.0)

This procedure describes how to downgrade a pair of VCX servers running these software configurations:

- IP Telephony and Messaging
- IP Telephony only
- IP Messaging only

Switch VCX Version

To switch the VCX version, perform the steps in this section, first on the primary server and then on the secondary server.

1. Log in as *root* and enter this command:

   `vcx-switchversion --manual 7.x`

   Example: `vcx-switchversion --manual 7.0.0c`

   The `vcx-switchversion` command:

   - Stops VCX services
   - Changes a link to point to the requested VCX version
   - Issues a warning that databases must be restored

   CAUTION: *Do not reboot the system or restart VCX services until databases have been restored. The VCX 7.0 version has been selected but the databases still contain 7.1 versioned data. This combination will not operate successfully.*

2. Update the pointer to the configuration file using this command:

   `SetConfigFile /opt/3com/VCX/conf/VCXConfiguration.xml`

Stop Database Replication

If the server is running IP Telephony and IP Messaging server software or IP Telephony server software, you must stop database replication.

CAUTION: *If the server is running IP Messaging server software do not perform the steps in this section.*

1. On the Master Definition Site (the primary server), log in as *root* and enter these commands:

   ```
   cd /opt/3com/VCX/scripts/rc3.d
   ./S70tomcat stop
   ```

2. On the Master Site (the secondary server) log in as *root* and enter these commands:

   ```
   cd /opt/3com/VCX/scripts/rc3.d
   ./S70tomcat stop
   ```

3. On the Master Definition Site (the primary server), log in as *cworks* and enter these commands:

   ```
   cd /opt/3com/VCX/vcxdata/bin
   ./dropReplication
   ```

4. When the script prompts you, enter the site ID of the Master Site.

Restore VCX Databases

Before upgrading from version 7.0 to 7.1, you must have backed up the system databases.

To restore the database on each server that is running the IP Telephony and Messaging or IP Telephony software configuration, see Restoring the VCX Authentication and Directory Server Database.

VCX systems require database replication between these servers. You must restore the database on both servers.

Restore IP Messaging Databases

Before upgrading from version 7.0 to 7.1, you must have backed up the IP Messaging databases

To restore the database on each server that is running IP Messaging server software, see the *IP Messaging Operations and System Administration Guide.*

VCX systems require mirroring between IP Messaging servers. You must restore the database on both servers.

Establish VCX Database Replication

On Master Definition Site that is running IP Telephony and IP Messaging server software or IP Telephony server software, establish database replication.

1. On the Master Definition Site (the primary server), log in as *root* and enter these commands:

   ```
   cd /opt/3com/VCX/scripts/rc3.d
   ./S20vcxdata stop
   ./S70tomcat stop
   ```

2. On the Master Site (the secondary server), log in as *root* and enter these commands:

   ```
   cd /opt/3com/VCX/scripts/rc3.d
   ./S70tomcat stop
   ```

3. On the Master Definition Site (the primary server), log in as *cworks* and enter these commands:

   ```
   cd /opt/3com/VCX/vcxdata/bin
   ./setupReplication
   ```

4. When the script prompts you, enter the site ID of the Master Site.

Verify Database Replication

1. Wait *at least* 20 minutes to allow time for database replication to be completed.

2. Enter these commands:

   ```
   cd /opt/3com/VCX/vcxdata/bin
   ./checkReplication
   ```

   The message that appears should contain the word NORMAL. If it does not, wait for a few more minutes and then repeat the command. Do not proceed beyond this point until you see the NORMAL message.

Switch Operating System version

The upgrade from 7.0 to 7.1 may or may not have required the installation of a new version of the VCX operating system. This procedure describes how to determine if a new operating system version was

installed and if so, how to revert to the previous version. This operation must be performed on all VCX servers.

The examples in this procedure use the assumption that upgrading from version 7.0 to 7.1 changed the operating system version from 4.2.1 to 5.1.3.

1 Log in as *root*.

2 To determine which operating system versions are available, enter this command:

`vcx-os-query`

The output from this command appears:

```
OS  Version    Partition          Label            Status
A   4.2.1 /dev/hda2          /A
B   5.1.3 /dev/hda3          /B               active
```

The operating system versions that you see may vary from the example shown.

The order of the A and B versions may be reversed depending on the upgrade history of the system.

When you are downgrading, use the earlier of the two operating system versions in this command:

`vcx-os-switch 4.2.1`

To confirm that you have selected the operating system version that you want, repeat the **`vcx-os-query`** command. Verify that the word "selected" appears in the Status column for the version that you want.

Example:

```
OS  Version    Partition          Label            Status
A   4.2.1 /dev/hda2          /A               selected
B   5.1.3 /dev/hda3          /B               active
```

Reboot the Server

Reboot the system using this command:

`reboot`

When the system reboots, it starts VCX 7.0 services.

Downgrading a Multiple-Site System (7.1 to 7.0)

For VCX systems that are installed at multiple sites, upgrades and downgrades must be performed using a specific sequence of servers, as described in this section.

CAUTION: *Back up all databases before beginning an upgrade.*

Downgrading Regional Authentication and Directory Servers

If a downgrade is required on a regional Authentication and Directory server, the procedure is the same as that described in Downgrading a Single-Site System (7.1 to 7.0) with one difference. Each Authentication and Directory server contains a database schema for each region.

For *each* schema, you must:

- Drop database replication
- Restore the database from the backup file
- Reestablish database replication

Downgrading Regional IP Messaging Servers

If a downgrade is required on a regional IP Messaging server, follow the procedure described in Downgrading a Single-Site System (7.1 to 7.0).

Downgrading Call Servers

To downgrade a pair of Call servers, perform these steps, first on the primary server and then on the secondary server:

1. Log in as *root* and switch the VCX version using this command:

   `vcx-switchversion --manual 7.x`

   Example: `vcx-switchversion --manual 7.0.0c`

   The `vcx-switchversion` command:

   - Stops VCX services
   - Changes a link to point to the requested VCX version
   - Issues a warning that databases must be restored

CAUTION: *Do not reboot the system or restart VCX services until databases have been restored. The VCX 7.0 version has been selected but the databases still contain 7.1 versioned data. This combination will not operate successfully.*

2. Update the pointer to the configuration file using this command:

   `SetConfigFile /opt/3com/VCX/conf/VCXConfiguration.xml`

3 Switch operating system version

The upgrade from 7.0 to 7.1 may or may not have required the installation of a new VCX operating system version. This step describes how to determine if a new operating system version was installed and if so, how to revert to the previous version.

The examples in this step use the assumption that upgrading from version 7.0 to 7.1 changed the operating system version from 4.2.1 to 5.1.3.

a Log in as *root*.

b To determine which operating system versions are available, enter this command:

`vcx-os-query`

The output from this command appears:

```
OS  Version    Partition          Label            Status
A   4.2.1 /dev/hda2          /A
B   5.1.3 /dev/hda3          /B               active
```

The operating system versions that you see may vary from the example shown.

The order of the A and B versions may be reversed depending on the upgrade history of the system.

When you are downgrading, use the earlier of the two operating system versions in this command:

`vcx-os-switch 4.2.1`

To confirm that you have selected the operating system version that you want, repeat the **`vcx-os-query`** command. Verify that the word "selected" appears in the Status column for the version that you want.

Example:

```
OS  Version    Partition          Label            Status
A   4.2.1 /dev/hda2          /A               selected
B   5.1.3 /dev/hda3          /B               active
```

4 Reboot the system using this command:

`reboot`

When the system reboots, it starts VCX 7.0 services.

Downgrading the Call Records Server

The Call Records server is a stand-alone server (it has no secondary server). To downgrade a Call Records server, perform these steps:

1. To switch the VCX version, log in as *root* and enter this command:

   `vcx-switchversion --manual 7.x`

   Example: `vcx-switchversion --manual 7.0.0c`

   The `vcx-switchversion` command:

   - Stops VCX services
   - Changes a link to point to the requested VCX version
   - Issues a warning that databases must be restored

   CAUTION: *Do not reboot the system or restart VCX services until databases have been restored. The VCX 7.0 version has been selected but the databases still contain 7.1 versioned data. This combination will not operate successfully.*

2. Update the pointer to the configuration file using this command:

   `SetConfigFile /opt/3com/VCX/conf/VCXConfiguration.xml`

3. If necessary, switch to the previous version of the operating system.

   The upgrade from 7.0 to 7.1 may or may not have required the installation of a new VCX operating system version. This step describes how to determine if a new operating system version was installed and if so, how to revert to the previous version.

   The examples in this step use the assumption that upgrading from version 7.0 to 7.1 changed the operating system version from 4.2.1 to 5.1.3.

   a. Log in as *root*.

   b. To determine which operating system versions are available, enter this command:

      `vcx-os-query`

   The output from this command appears:

   Example:

```
OS  Version    Partition          Label            Status
A   4.2.1 /dev/hda2          /A
B   5.1.3 /dev/hda3          /B               active
```

   The operating system versions that you see may vary from the example shown.

The order of the A and B versions may be reversed depending on the upgrade history of the system.

c When you are downgrading, use the earlier of the two operating system versions in this command:

```
vcx-os-switch 4.2.1
```

d To confirm that you have selected the operating system version that you want, repeat the **`vcx-os-query`** command. Verify that the word "selected" appears in the *Status* column for the version that you want.

Example:

```
OS  Version    Partition          Label            Status
A   4.2.1 /dev/hda2          /A               selected
B   5.1.3 /dev/hda3          /B               active
```

4 Reboot the system using this command:

```
reboot
```

When the system reboots, it starts VCX 7.0 services.

Downgrading a Branch Office Server

If you attempt to upgrade a branch office server but the upgrade is unsuccessful, you must downgrade and contact 3Com Support for assistance.

Switch VCX Version

To switch the VCX version:

1 Log in as *root* and enter this command:

```
vcx-switchversion --manual 7.x
```

Example: **`vcx-switchversion --manual 7.0.0c`**

The `vcx-switchversion` command:

- Stops VCX services
- Changes a link to point to the requested VCX version
- Issues a warning that databases must be restored

CAUTION: *Do not reboot the system or restart VCX services until databases have been restored. The VCX 7.0 version has been selected but*

the databases still contain 7.1 versioned data. This combination will not operate successfully.

2 Update the pointer to the configuration file using this command:

```
SetConfigFile /opt/3com/VCX/conf/VCXConfiguration.xml
```

Stop Database Replication

1 On the Master Definition Site (the primary server), log in as *root* and enter these commands:

```
cd /opt/3com/VCX/scripts/rc3.d
./S70tomcat stop
```

2 On the Master Site (the secondary server) log in as *root* and enter these commands:

```
cd /opt/3com/VCX/scripts/rc3.d
./S70tomcat stop
```

3 On the Master Definition Site (the primary server), log in as *cworks* and enter these commands:

```
cd /opt/3com/VCX/vcxdata/bin
./dropReplication
```

4 When the script prompts you, enter the site ID of the Master Site.

Restore Databases

Before upgrading from version 7.0 to 7.1, you must have backed up the system databases.

1 Restore the database on branch office server. See Restoring the VCX Authentication and Directory Server Database.

VCX systems require database replication between the regional and branch office servers. You must restore the database on both the regional Data server and the branch office server.

2 If the branch office server is running the IP Messaging software, restore the IP Messaging database. See the *IP Messaging Operations and System Administration Guide.*

VCX systems require mirroring between IP Messaging servers. You must restore the database on both the regional office IP Messaging server and the branch office server.

Establish Database Replication

On Master Definition Site, establish database replication.

1. On the Master Definition Site (the primary server), log in as *root* and enter these commands:

   ```
   cd /opt/3com/VCX/scripts/rc3.d
   ./S20vcxdata stop
   ./S70tomcat stop
   ```

2. On the Master Site (the secondary server), log in as *root* and enter these commands:

   ```
   cd /opt/3com/VCX/scripts/rc3.d
   ./S70tomcat stop
   ```

3. On the Master Definition Site (the primary server), log in as *cworks* and enter these commands:

   ```
   cd /opt/3com/VCX/vcxdata/bin
   ./setupReplication
   ```

4. When the script prompts you, enter the site ID of the Master Site.

Verify Database Replication

1. Wait *at least* 20 minutes to allow time for database replication to be completed.

2. Enter these commands:

   ```
   cd /opt/3com/VCX/vcxdata/bin
   ./checkReplication
   ```

   The message that appears should contain the word NORMAL. If it does not, wait for a few more minutes and then repeat the command. Do not proceed beyond this point until you see the NORMAL message.

Switch Operating System version

The upgrade from 7.0 to 7.1 may or may not have required the installation of a new version of the VCX operating system. This procedure describes how to determine if a new operating system version was installed and if so, how to revert to the previous version.

The examples in this procedure use the assumption that upgrading from version 7.0 to 7.1 changed the operating system version from 4.2.1 to 5.1.3.

1. Log in as *root*.
2. To determine which operating system versions are available, enter this command:

   vcx-os-query

   The output from this command appears:

   ```
   OS  Version    Partition          Label            Status
   A   4.2.1 /dev/hda2          /A
   B   5.1.3 /dev/hda3          /B               active
   ```

The operating system versions that you see may vary from the example shown.

The order of the A and B versions may be reversed depending on the upgrade history of the system.

   When you are downgrading, use the earlier of the two operating system versions in this command:

   vcx-os-switch 4.2.1

   To confirm that you have selected the operating system version that you want, repeat the **vcx-os-query** command. Verify that the word "selected" appears in the Status column for the version that you want.

   Example:

   ```
   OS  Version    Partition          Label            Status
   A   4.2.1 /dev/hda2          /A               selected
   B   5.1.3 /dev/hda3          /B               active
   ```

Reboot the Server

Reboot the system using this command:

reboot

When the system reboots, it starts VCX 7.1.*x* services.

Downgrading from 7.1.y to 7.1.x

Follow the procedures in this section to downgrade your VCX system from version 7.1.*y* to 7.1.*x*.

Important Considerations

Before performing a downgrade, keep these considerations in mind:

- Downgrades are typically performed for one of the following reasons:
  - You have successfully upgraded your VCX system but want to revert to the previous version of VCX system software.
  - During a VCX system upgrade, one component fails to upgrade and want to revert to the previous version of VCX system software. If a component fails to upgrade, contact your 3Com Support for assistance before proceeding.
- To use the downgrade procedures in this section, your VCX system must have previously been successfully running version 7.1.*x*. The downgrade procedure does not "back-port" any configuration or database modifications you might have made while running version 7.1.*y*. Following this procedure restores the VCX system to the operational state it was in prior to the upgrade occurring.
- If an upgrade at a regional office is unsuccessful, contact your 3Com Support for assistance and downgrade the regional office servers. Do not upgrade any branch office servers that are associated with that regional office until the regional office upgrades are successful.
- The database schema version on a branch office server must match the schema version on the regional office Authentication and Directory server. After a successful upgrade of a regional office, if an upgrade of any branch office server is unsuccessful, contact your 3Com Support for assistance and downgrade that branch office server.
- The VCX system supports two operating system images. If the upgrade required installation of a new VCX operating system version, then the downgrade must revert to the previous installation.
- The person performing the downgrade should be trained in VCX operation and procedures, and be familiar with VCX terminology.
- This downgrade procedure assumes the VCX version 7.1.*x* system databases were backed up before the upgrade to version 7.1.*y* was performed. These version 7.1.*x* backups will be restored as part of the downgrade procedure.

Note that the downgrade procedure does not remove VCX version 7.1.*y* software from your VCX system.

Downgrading a Single-Site System (7.1.y to 7.1.x)

This procedure describes how to downgrade a pair of VCX servers running these software configurations:

- IP Telephony and Messaging
- IP Telephony only
- IP Messaging only

Switch VCX Version

To switch the VCX version, perform the steps in this section, first on the primary server and then on the secondary server.

1 Log in as *root* and enter this command:

```
vcx-switchversion --manual 7.x
```

Example: `vcx-switchversion --manual 7.1.0c`

The `vcx-switchversion` command:

- Stops VCX services
- Changes a link to point to the requested VCX version
- Issues a warning that databases must be restored

CAUTION: *Do not reboot the system or restart VCX services until databases have been restored. The VCX 7.1.x version has been selected but the databases still contain 7.1.y versioned data. This combination will not operate successfully.*

2 Update the pointer to the configuration file using this command:

```
SetConfigFile /opt/3com/VCX/conf/VCXConfiguration.xml
```

Stop Database Replication

If the server is running IP Telephony and IP Messaging server software or IP Telephony server software, you must stop database replication.

CAUTION: *If the server is running IP Messaging server software do not perform the steps in this section.*

1 On the Master Definition Site (the primary server), log in as *root* and enter these commands:

```
cd /opt/3com/VCX/scripts/rc3.d
./S70tomcat stop
```

2 On the Master Site (the secondary server) log in as *root* and enter these commands:

```
cd /opt/3com/VCX/scripts/rc3.d
./S70tomcat stop
```

3 On the Master Definition Site (the primary server), log in as *cworks* and enter these commands:

```
cd /opt/3com/VCX/vcxdata/bin
./dropReplication
```

4 When the script prompts you, enter the site ID of the Master Site.

Restore VCX Databases

Before upgrading from version 7.1.*x* to 7.1.*y*, you must have backed up the system databases.

To restore the database on each server that is running the IP Telephony and Messaging or IP Telephony software configuration, see Restoring the VCX Authentication and Directory Server Database.

VCX systems require database replication between these servers. You must restore the database on both servers.

Restore IP Messaging Databases

Before upgrading from version 7.1.*x* to 7.1.*y*, you must have backed up the IP Messaging databases

To restore the database on each server that is running IP Messaging server software, see the *IP Messaging Operations and System Administration Guide*.

VCX systems require mirroring between IP Messaging servers. You must restore the database on both servers.

Establish VCX Database Replication

On Master Definition Site that is running IP Telephony and IP Messaging server software or IP Telephony server software, establish database replication.

1. On the Master Definition Site (the primary server), log in as *root* and enter these commands:

   ```
   cd /opt/3com/VCX/scripts/rc3.d
   ./S20vcxdata stop
   ./S70tomcat stop
   ```

2. On the Master Site (the secondary server), log in as *root* and enter these commands:

   ```
   cd /opt/3com/VCX/scripts/rc3.d
   ./S70tomcat stop
   ```

3. On the Master Definition Site (the primary server), log in as *cworks* and enter these commands:

   ```
   cd /opt/3com/VCX/vcxdata/bin
   ./setupReplication
   ```

4. When the script prompts you, enter the site ID of the Master Site.

Verify Database Replication

1. Wait *at least* 20 minutes to allow time for database replication to be completed.

2. Enter these commands:

   ```
   cd /opt/3com/VCX/vcxdata/bin
   ./checkReplication
   ```

   The message that appears should contain the word NORMAL. If it does not, wait for a few more minutes and then repeat the command. Do not proceed beyond this point until you see the NORMAL message.

Switch Operating System version

The upgrade from 7.1.*x* to 7.1.*y* may or may not have required the installation of a new version of the VCX operating system. This procedure describes how to determine if a new operating system version was installed and if so, how to revert to the previous version. This operation must be performed on all VCX servers.

The examples in this procedure use the assumption that upgrading from version 7.1.x to 7.1.y changed the operating system version from 4.2.0 to 4.2.1.

1 Log in as *root*.

2 To determine which operating system versions are available, enter this command:

`vcx-os-query`

The output from this command appears:

```
OS  Version    Partition          Label            Status
A   4.2.0      /dev/hda2          /A
B   4.2.1      /dev/hda3          /B               active
```

The operating system versions that you see may vary from the example shown.

The order of the A and B versions may be reversed depending on the upgrade history of the system.

When you are downgrading, use the earlier of the two operating system versions in this command:

`vcx-os-switch 4.2.0`

To confirm that you have selected the operating system version that you want, repeat the **`vcx-os-query`** command. Verify that the word "selected" appears in the Status column for the version that you want.

Example:

```
OS  Version    Partition          Label            Status
A   4.2.0      /dev/hda2          /A               selected
B   4.2.1      /dev/hda3          /B               active
```

Reboot the Server

Reboot the system using this command:

`reboot`

When the system reboots, it starts VCX 7.1.*x* services.

Downgrading a Multiple-Site System (7.1.y to 7.1.x)

For VCX systems that are installed at multiple sites, upgrades and downgrades must be performed using a specific sequence of servers, as described in this section.

CAUTION: *Back up all databases before beginning an upgrade.*

Downgrading Regional Authentication and Directory Servers

If a downgrade is required on a regional Authentication and Directory server, the procedure is the same as that described in Downgrading a Single-Site System (7.1.y to 7.1.x) with one difference. Each Authentication and Directory server contains a database schema for each region.

For *each* schema, you must:

- Drop database replication
- Restore the database from the backup file
- Reestablish database replication

Downgrading Regional IP Messaging Servers

If a downgrade is required on a regional IP Messaging server, follow the procedure described in Downgrading a Single-Site System (7.1.y to 7.1.x).

Downgrading Call Servers

To downgrade a pair of Call servers, perform these steps, first on the primary server and then on the secondary server:

1 Log in as *root* and switch the VCX version using this command:

```
vcx-switchversion --manual 7.x
```

Example: `vcx-switchversion --manual 7.1.0c`

The `vcx-switchversion` command:

- Stops VCX services
- Changes a link to point to the requested VCX version
- Issues a warning that databases must be restored

CAUTION: *Do not reboot the system or restart VCX services until databases have been restored. The VCX 7.1.x version has been selected but the databases still contain 7.1.y versioned data. This combination will not operate successfully.*

2 Update the pointer to the configuration file using this command:

```
SetConfigFile /opt/3com/VCX/conf/VCXConfiguration.xml
```

3 Switch operating system version

The upgrade from 7.1.x to 7.1.y may or may not have required the installation of a new VCX operating system version. This step describes

how to determine if a new operating system version was installed and if so, how to revert to the previous version.

The examples in this step use the assumption that upgrading from version 7.1.x to 7.1.y changed the operating system version from 4.2.0 to 4.2.1.

a Log in as *root*.

b To determine which operating system versions are available, enter this command:

`vcx-os-query`

The output from this command appears:

```
OS  Version    Partition          Label            Status
A   4.2.0      /dev/hda2          /A
B   4.2.1      /dev/hda3          /B               active
```

The operating system versions that you see may vary from the example shown.

The order of the A and B versions may be reversed depending on the upgrade history of the system.

When you are downgrading, use the earlier of the two operating system versions in this command:

`vcx-os-switch 4.2.0`

To confirm that you have selected the operating system version that you want, repeat the **`vcx-os-query`** command. Verify that the word "selected" appears in the Status column for the version that you want.

Example:

```
OS  Version    Partition          Label            Status
A   4.2.0      /dev/hda2          /A               selected
B   4.2.1      /dev/hda3          /B               active
```

4 Reboot the system using this command:

`reboot`

When the system reboots, it starts VCX 7.1.*x* services.

Downgrading the Call Records Server

The Call Records server is a stand-alone server (it has no secondary server). To downgrade a Call Records server, perform these steps:

1. To switch the VCX version, log in as *root* and enter this command:

   `vcx-switchversion --manual 7.x`

   Example: `vcx-switchversion --manual 7.1.0c`

   The `vcx-switchversion` command:

   - Stops VCX services
   - Changes a link to point to the requested VCX version
   - Issues a warning that databases must be restored

   CAUTION: *Do not reboot the system or restart VCX services until databases have been restored. The VCX 7.1.x version has been selected but the databases still contain 7.1.y versioned data. This combination will not operate successfully.*

2. Update the pointer to the configuration file using this command:

   `SetConfigFile /opt/3com/VCX/conf/VCXConfiguration.xml`

3. If necessary, switch to the previous version of the operating system.

   The upgrade from 7.1.x to 7.1.y may or may not have required the installation of a new VCX operating system version. This step describes how to determine if a new operating system version was installed and if so, how to revert to the previous version.

   The examples in this step use the assumption that upgrading from version 7.1.x to 7.1.y changed the operating system version from 4.2.0 to 4.2.1.

   a. Log in as *root*.

   b. To determine which operating system versions are available, enter this command:

      `vcx-os-query`

   The output from this command appears:

   Example:

```
OS  Version    Partition          Label            Status
A   4.2.0      /dev/hda2          /A
B   4.2.1      /dev/hda3          /B               active
```

   The operating system versions that you see may vary from the example shown.

The order of the A and B versions may be reversed depending on the upgrade history of the system.

c When you are downgrading, use the earlier of the two operating system versions in this command:

```
vcx-os-switch 4.2.0
```

d To confirm that you have selected the operating system version that you want, repeat the **`vcx-os-query`** command. Verify that the word "selected" appears in the *Status* column for the version that you want.

Example:

```
OS  Version    Partition          Label            Status
A   4.2.0      /dev/hda2          /A               selected
B   4.2.1      /dev/hda3          /B               active
```

4 Reboot the system using this command:

```
reboot
```

When the system reboots, it starts VCX 7.1.*x* services.

Downgrading a Branch Office Server

If you attempt to upgrade a branch office server but the upgrade is unsuccessful, you must downgrade and contact 3Com Support for assistance.

Switch VCX Version

To switch the VCX version:

1 Log in as *root* and enter this command:

```
vcx-switchversion --manual 7.x
```

Example: **`vcx-switchversion --manual 7.1.0c`**

The `vcx-switchversion` command:

- Stops VCX services
- Changes a link to point to the requested VCX version
- Issues a warning that databases must be restored

CAUTION: *Do not reboot the system or restart VCX services until databases have been restored. The VCX 7.1.x version has been selected*

but the databases still contain 7.1.y versioned data. This combination will not operate successfully.

2 Update the pointer to the configuration file using this command:

```
SetConfigFile /opt/3com/VCX/conf/VCXConfiguration.xml
```

Stop Database Replication

1 On the Master Definition Site (the primary server), log in as *root* and enter these commands:

```
cd /opt/3com/VCX/scripts/rc3.d
./S70tomcat stop
```

2 On the Master Site (the secondary server) log in as *root* and enter these commands:

```
cd /opt/3com/VCX/scripts/rc3.d
./S70tomcat stop
```

3 On the Master Definition Site (the primary server), log in as *cworks* and enter these commands:

```
cd /opt/3com/VCX/vcxdata/bin
./dropReplication
```

4 When the script prompts you, enter the site ID of the Master Site.

Restore Databases

Before upgrading from version 7.1.*x* to 7.1.*y*, you must have backed up the system databases.

1 Restore the database on branch office server. See Restoring the VCX Authentication and Directory Server Database.

VCX systems require database replication between the regional and branch office servers. You must restore the database on both the regional Data server and the branch office server.

2 If the branch office server is running the IP Messaging software, restore the IP Messaging database. See the *IP Messaging Operations and System Administration Guide.*

VCX systems require mirroring between IP Messaging servers. You must restore the database on both the regional office IP Messaging server and the branch office server.

Establish Database Replication

On Master Definition Site, establish database replication.

1 On the Master Definition Site (the primary server), log in as *root* and enter these commands:

```
cd /opt/3com/VCX/scripts/rc3.d
./S20vcxdata stop
./S70tomcat stop
```

2 On the Master Site (the secondary server), log in as *root* and enter these commands:

```
cd /opt/3com/VCX/scripts/rc3.d
./S70tomcat stop
```

3 On the Master Definition Site (the primary server), log in as *cworks* and enter these commands:

```
cd /opt/3com/VCX/vcxdata/bin
./setupReplication
```

4 When the script prompts you, enter the site ID of the Master Site.

Verify Database Replication

1 Wait *at least* 20 minutes to allow time for database replication to be completed.

2 Enter these commands:

```
cd /opt/3com/VCX/vcxdata/bin
./checkReplication
```

The message that appears should contain the word NORMAL. If it does not, wait for a few more minutes and then repeat the command. Do not proceed beyond this point until you see the NORMAL message.

Switch Operating System version

The upgrade from 7.1.*x* to 7.1.*y* may or may not have required the installation of a new version of the VCX operating system. This procedure describes how to determine if a new operating system version was installed and if so, how to revert to the previous version.

The examples in this procedure use the assumption that upgrading from version 7.1.x to 7.1.y changed the operating system version from 4.2.0 to 4.2.1.

1. Log in as *root*.
2. To determine which operating system versions are available, enter this command:

   vcx-os-query

   The output from this command appears:

```
OS  Version     Partition          Label            Status
A   4.2.0       /dev/hda2          /A
B   4.2.1       /dev/hda3          /B               active
```

The operating system versions that you see may vary from the example shown.

The order of the A and B versions may be reversed depending on the upgrade history of the system.

When you are downgrading, use the earlier of the two operating system versions in this command:

vcx-os-switch 4.2.0

To confirm that you have selected the operating system version that you want, repeat the **vcx-os-query** command. Verify that the word "selected" appears in the Status column for the version that you want.

Example:

```
OS  Version     Partition          Label            Status
A   4.2.0       /dev/hda2          /A               selected
B   4.2.1       /dev/hda3          /B               active
```

Reboot the Server

Reboot the system using this command:

reboot

When the system reboots, it starts VCX 7.1.*x* services.

Downgrading from 7.0 to 6.0

Follow the procedures in this section to downgrade your VCX system from version 7.0 to 6.0.

Important Considerations

Before performing a downgrade, keep these considerations in mind:

- Downgrades are typically performed for one of the following reasons:
  - You have successfully upgraded your VCX system but want to revert to the previous version of VCX system software.
  - During a VCX system upgrade, one component fails to upgrade and want to revert to the previous version of VCX system software. If a component fails to upgrade, contact your 3Com Support for assistance before proceeding.
- To use the downgrade procedures in this section, your VCX system must have previously been successfully running version 6.0.x.
- The VCX system supports two operating system images. If the upgrade required installation of a new VCX operating system version, then the downgrade must revert to the previous installation.
- This downgrade procedure assumes the VCX version 6.0 system databases were backed up before the upgrade to version 7.0 was performed. These version 6.0 backups will be restored as part of the downgrade procedure.
- The downgrade procedure does not "back-port" any configuration or database modifications you might have made while running version 7.0. Following this procedure restores the VCX system to the operational state it was in prior to the upgrade occurring.
- If an upgrade at a regional office is unsuccessful, contact your 3Com Support for assistance and downgrade the regional office servers. Do not upgrade any branch office servers that are associated with that regional office until the regional office upgrades are successful.
- The database schema version on a branch office server must match the schema version on the regional office Authentication and Directory server. After a successful upgrade of a regional office, if an upgrade of any branch office server is unsuccessful, contact your 3Com Support for assistance and downgrade that branch office server.
- The person performing the downgrade should be trained in VCX operation and procedures, and be familiar with VCX terminology.

The downgrade procedure does not remove VCX version 7.0 software from your VCX system.

If you have configured a VCX server running version 7.0 software for RAID operation, you cannot downgrade that server to version 6.0 software. VCX servers running software versions prior to the 7.0 release do not support RAID configuration. If a VCX server enabled for RAID operation must be downgraded to a software version prior to 7.0, the server must be rebuilt. Contact your 3Com representative.

Downgrading a Single-Site System

This procedure describes how to downgrade VCX single-site systems. Single-site VCX systems can have either two servers or four servers.

- In a two-server configuration, each server runs IP Telephony server software and IP Messaging server software.

  The downgrade steps described in the following sections must be performed on each server.

- In a four-server configuration, one pair of servers runs IP Telephony server software; the second pair of servers runs IP Messaging server software.

  The downgrade steps described in the following sections must be performed on each server running IP Telephony server software. For servers running IP Messaging server software, the database maintenance steps are not required.

Switch VCX Version

To switch the VCX version, perform the steps in this section on each server in the single-site system.

- In a two-server configuration, perform the steps first on the primary server and then on the secondary server.
- In a four-server configuration, perform the steps first on the primary IP Telephony server and then on the secondary IP Telephony server. Then perform the steps first on the primary IP Messaging server and then on the secondary IP Messaging server.

1. Log in to the server as *root* user.
2. Enter the following command:

   ```
   vcx-switchversion --manual 6.x
   ```

   For example, to downgrade to VCX version 6.0.2.c, enter:

   ```
   vcx-switchversion --manual 6.0.2c
   ```

The `vcx-switchversion` command:

- Stops VCX services
- Changes the /opt/3com/VCX link to point to the requested VCX version
- Issues a warning that databases must be restored

CAUTION: *Do not reboot the system or restart VCX services until databases have been restored. The VCX 6.0.x version has been selected but the databases still contain 7.0 versioned data. This combination will not operate successfully.*

If you are downgrading a IP Telephony and IP Messaging server, or an IP Telephony server, go to the next section, Stop VCX Database Replication.

If you are downgrading a IP Messaging server, go to Switch Operating System Versions and Reboot.

Stop VCX Database Replication

If the server is running the IP Telephony and Messaging or the IP Telephony software configuration, you must stop database replication. These steps are executed on the primary server only. Also, ensure that you have executed the **`vcx-switchversion`** command on both the primary and secondary IP Telephony and Messaging or the IP Telephony servers before stopping database replication on the primary server.

CAUTION: *If the server is running the IP Messaging software configuration do not perform the steps in this section.*

1. Log in to the Master Definition Site (the primary server) as *cworks* user.
2. Enter the following commands:

   ```
   cd /opt/3com/VCX/vcxdata/bin
   ./dropReplication
   ```

3. When the script prompts you, enter the site ID of the Master Site.
4. Go to the next section, Remove Version 7.0 Database Schemas.

Remove Version 7.0 Database Schemas

To remove the version 7.0 database schema, perform the following steps, first on the primary server, then on the secondary server:

1. Log in to the server as *cworks* user.
2. Enter the following commands:

```
cd /opt/3com/VCX/vcxdata/bin
./dropVcxdata
```

3. When the script prompts you, enter the site name for the database.
4. Go to the next section, Create Version 6.0 Database Schemas.

Create Version 6.0 Database Schemas

To create the version 6.0 database schema, perform the following steps, first on the primary server, then on the secondary server:

1. Log in to the server as *root* user.
2. Enter the following commands:

```
cd /opt/3com/VCX/scripts/firstboot
./F20vcxdata
```

3. Go to the next section, Restore VCX Databases.

Restore VCX Databases

To restore the database on the primary and secondary servers that are running the IP Telephony and Messaging or IP Telephony software configuration, see Restoring the VCX Authentication and Directory Server Database.

You must restore the database on both primary and secondary servers prior to starting database replication.

Go to the next section, Restart VCX Database Replication.

Restart VCX Database Replication

On Master Definition Site that is running the IP Telephony and IP Messaging or IP Telephony software configuration, restart database replication.

1. Log in to the Master Definition Site (the primary server) as *cworks* user.
2. Enter the following commands:

   ```
   cd /opt/3com/VCX/vcxdata/bin
   ./setupReplication
   ```

3. When the script prompts you, enter the site ID of the Master Site.
4. Wait *at least* 20 minutes to allow time for database replication to be completed.
5. Enter the following commands to verify that replication is complete:

   ```
   cd /opt/3com/VCX/vcxdata/bin
   ./checkReplication
   ```

   The message that appears should contain the word NORMAL. If it does not, wait for a few more minutes and then repeat the command. Do *not* continue until you see the NORMAL message.

   When replication is complete, go to the next section, Switch Operating System Versions and Reboot.

Switch Operating System Versions and Reboot

The VCX system supports two operating system images. If the upgrade required installation of a new VCX operating system version, then the downgrade must revert to the previous installation.

The procedure in this section describes how to determine if a new operating system version was installed and if so, how to revert to the previous version.

The examples in this procedure use the assumption that upgrading from version 6.0 to 7.0 changed the operating system version from 3.4.0 to 4.2.1.

1. Log in as *root*.
2. Enter the following command to determine which operating system versions are available:

   ```
   vcx-os-query
   ```

The output from this command is similar to the following:

```
OS  Version     Partition          Label            Status
A   3.4.0       /dev/hda2          /A
B   4.2.1       /dev/hda3          /B               active
```

The operating system versions that you see may vary from the example shown. Also, the order of the A and B versions may be reversed depending on the upgrade history of the system.

3 Select the operating system version (in this example, 3.4.0) to use after rebooting by entering the following command:

```
vcx-os-switch 3.4.0
```

Execute this command on the primary server and then on the secondary server prior to rebooting (step 5). Both servers must be switched to the same operating system before rebooting.

4 To confirm that you have selected the operating system version that you want, repeat the **vcx-os-query** command. Verify that the word "selected" appears in the Status column for the version that you want.

```
vcx-os-query
OS  Version     Partition          Label            Status
A   3.4.0       /dev/hda2          /A               selected
B   4.2.1       /dev/hda3          /B               active
```

5 Enter the following command to reboot the system:

```
reboot
```

When the system reboots, it starts VCX 6.0 services.

Downgrading a Multi-Site System

For multi-site VCX systems, upgrades and downgrades must be performed in a specific sequence.

The components in a multi-site VCX system can be set up in many possible configurations. The procedures in this section are based on a multi-site VCX system that includes two regions (Region 1 and Region 2) with multiple branch offices in each region.

If you have successfully upgraded the entire multi-site VCX system, you should downgrade servers in the following order:

- Downgrade the branch servers in each region.
- Downgrade the Authentication and Directory server in each region.

- Downgrade the IP Messaging servers in each region.
- Downgrade the Call servers in each region.
- Downgrade the Call Records server.

If the upgrade process fails while upgrading any type of VCX server, consult with your 3Com representative before attempting to downgrade the server. Follow the downgrade procedures documented in this section only if you want to revert a successfully upgraded server from version 7.0 to version 6.0.

Downgrading Regional Authentication and Directory Servers

Each Region has an Authentication and Directory server. Each server has a schema for its own database *and* a schema that acts as a backup for the schema in the other Region.

Follow the general steps in this section if a downgrade is required on a regional Authentication and Directory server. See Downgrading a Single-Site System for detailed information for each general step.

If you need to downgrade a branch server, downgrade the branch before downgrading the regional Authentication and Directory server hosting that branch. See Downgrading a Branch Office.

On each Authentication and Directory server you must switch versions of VCX software. See Switch VCX Version.

For *each* schema, you must:

- Log in to each Authentication and Directory server and drop database replication. See Stop VCX Database Replication.
- Remove both schemas on each region. See Remove Version 7.0 Database Schemas.
- Create a schema on each region. See Create Version 6.0 Database Schemas.
- Create backup schemas on each region using the following procedure:

a Log in to the Authentication and Directory server in each region as *cworks*.

b Enter the following commands:

```
cd /opt/3com/VCX/vcxdata/bin
./installVcxdata
```

c Select option 2 - Create as Backup Database schema for a Regional Office.

- Restore databases to the schema and backup schema on each Authentication and Directory server. See Restore VCX Databases.
- Set up database replication for both schema pairs on each Authentication and Directory server. See Restart VCX Database Replication.

Finally, on each Authentication and Directory server you must switch operation systems and reboot. See Switch Operating System Versions and Reboot.

Downgrading IP Messaging Servers

If a downgrade from version 7.0 to version 6.0 is required on a pair of regional IP Messaging servers, follow the procedures for IP Messaging described in Downgrading a Single-Site System. Specifically, you should execute the procedures described in Switch VCX Version and Switch Operating System Versions and Reboot on the primary IP Messaging server and then the secondary IP Messaging server.

Downgrading Call Servers

If a downgrade from version 7.0 to version 6.0 is required on a pair of regional Call servers, follow the procedures described in Switch VCX Version and Switch Operating System Versions and Reboot on the primary Call server and then the secondary Call server.

Downgrading the Call Records Server

If a downgrade from version 7.0 to version 6.0 is required on regional Call Records server, follow the procedures described in Switch VCX Version and Switch Operating System Versions and Reboot.

Downgrading a Branch Office

If a downgrade from version 7.0 to version 6.0 is required on a branch server in a multi-site VCX system, follow the procedures described in this section.

A branch must be running the same version of VCX software as the regional servers hosting the branch. This section assumes that all of the regional servers and the branch have been upgraded successfully. If the branch upgrade failed, contact your 3Com representative before attempting to downgrade to the previous release.

To downgrade a branch server:

1. Log in as *root* on the primary and secondary regional Call servers and the branch.
2. Stop the Tomcat process, first on the primary Call server, then on the secondary Call server, and then on the branch server by entering the following commands:

   ```
   cd /opt/3com/VCX/scripts/rc3.d
   ./S70tomcat stop
   ```

3. Log in as *cworks* on the regional Authentication and Directory server (the Master Definition site) associated with the branch and enter the following commands to stop replication on branch database:

   ```
   cd /opt/3com/VCX/vcxdata/bin
   ./dropReplication
   ```

   When the script prompts you, enter the site ID of the branch.
4. On the regional Authentication and Directory server associated with the branch (still logged in as *cworks*), enter the following commands to delete the branch schema:

   ```
   cd /opt/3com/VCX/vcxdata/bin
   ./dropVcxdata
   ```

   When the script prompts you, enter the site ID of the branch.
5. Log in as *root* to the regional Authentication and Directory server associated with the branch and enter the following commands to stop the globaldir service:

   ```
   cd /opt/3com/VCX/scripts/rc3.d
   ./S30vcxglobaldir stop
   ```

6. Log in as *cworks* on the regional Authentication and Directory server associated with the branch and enter the following commands to create a 6.0 branch schema:

   ```
   cd /opt/3com/VCX.6.0.xc/vcxdata/bin
   ./installVcxdata
   ```

   For **x**, enter the particular version of version 6.0 software (for example, **6.0.2.c**).

   Select option **1** and enter the site ID for the branch.
7. Restore the branch 6.0 data on the region.

a Copy the backup data (tgz file) for branch schema to the following two locations:

```
/opt/3com/VCX/vcxdata/db/import
/opt/3com/VCX/vcxdata/db/export
```

b Enter the following commands:

```
cd /opt/3com/VCX.6.0.x/vcxdata/bin
./restoreVcxdata
```

Enter the site ID for the branch.

8 Log in as *cworks* on the branch and delete the branch schema by entering the following commands:

```
cd /opt/3com/VCX/vcxdata/bin
./dropVcxdata
```

Enter the site ID for the branch.

9 Log in as *cworks* on the branch and switch to previous version of VCX software by entering the following command:

```
vcx-switchversion --manual 6.0.xc
```

For **x**, enter the particular version of version 6.0 software (for example, **6.0.2.c**).

10 Log in as *root* on the branch and switch to the previous operating system version. Follow steps 1 through 4 in Switch Operating System Versions and Reboot). Do *not* enter the reboot command (step 5). Instead, enter the following commands to run firstboot script on the branch:

```
cd /opt/3com/VCX/scripts/firstboot
./F20vcxdata
```

11 Wait *at least* 20 minutes to allow time for database replication to be completed.

12 Enter the following commands to verify that replication is complete:

```
cd /opt/3com/VCX/vcxdata/bin
./checkReplication
```

The message that appears should contain the word NORMAL. If it does not, wait for a few more minutes and then repeat the command. Do *not* continue until you see the NORMAL message.

13 Log in as *root* and start the Tomcat process, first on the primary Call server, and then on the secondary Call server by entering the following commands:

```
cd /opt/3com/VCX/scripts/rc3.d
```

```
./S70tomcat start
```

14 Log in as *root* to the regional Authentication and Directory server associated with the branch and enter the following commands to start the globaldir service:

```
cd /opt/3com/VCX/scripts/rc3.d
./S30vcxglobaldir start
```

At this point, because there is a version mismatch between the branch database and the regional database, you cannot access branch data through provisioning at the region. You must use the provisioning interface on the branch server.

E

VCX COMMANDS

This appendix describes the VCX commands you can use to manage and view VCX components. This appendix includes the following topic:

- Command Descriptions

Command Descriptions

This guide describes how to maintain your VCX system. Most maintenance operations require entering commands to perform a particular task or to run a script.

The tables in this appendix describe all available VCX commands. Many of these commands are used (and described) elsewhere in this guide to perform maintenance tasks. In this case, the tables provide cross references to the relevant topics.

Many commands have required or optional arguments. For these commands, you can use the `--help` argument to view command syntax.

Table 16 lists commands you can use to reconfigure or back up a VCX configuration.

Table 16 VCX Configuration and Backup Commands

Command	Description
vcx-reconfigure	Changes IP addresses or most other first-time setup parameters (certain parameters cannot be reconfigured). See Chapter 7.
vcx-config-network	Changes network settings. Typically invoked as part of the vcx-reconfigure operation. However, you can use this command to modify the time zone setting for a machine. See Changing a Daylight Saving and Time Zone Configuration.
vcx-config-services --show	Changes a service configuration. Typically invoked as part of a higher level script. However, you can use this command with the `--show` argument to return a multi-page display that shows your VCX system configuration.
vcx-config-backup	For VCX versions 7.1 and higher, backs up the current VCX software and VCX operating system configuration. See Backing Up a VCX Configuration.
vcx-config-restore	For VCX versions 7.1 and higher, restores an archived VCX software and VCX operating system configuration. See Restoring a VCX Configuration
vcx-backup-query	For VCX versions 7.1 and higher, displays information about the specified VCX configuration backup file. See Examining a Backup File.

Table 17 lists commands you can use for various installation and removal tasks, or to switch between versions of installed VCX software.

Table 17 VCX Installation, Removal, and Switching Commands

Command	Description
vcx-install	Used to install VCX components. Typically invoked as part of a higher level script. However, you can use this command install a codec. See How to Change Your Codec.
vcx-os-query	Displays the installed VCX operating systems and, if there are multiple systems installed, indicates which one is active. This command is described in the upgrade and downgrade appendixes.
vcx-os-switch	Switches between installed versions of the VCX operating system. This command is described in the upgrade and downgrade appendixes.
vcx-removeversion	Removes an earlier, installed version of VCX software.
vcx-switchversion	Switches between installed versions of VCX software. This command is described in the upgrade and downgrade appendixes.

Table 18 lists commands you can use to manage VCX software licenses. For VCX versions 7.0 and higher, you *must* obtain and activate a license key for each VCX server before you can install new server software, or upgrade from VCX software version 6.0 (or earlier). See License Keys for more information.

Table 18 VCX Licensing Commands

Command	Description
vcx-show machineid	Displays the machine ID of the computer. A machine ID uniquely associates one server to a VCX software license key. See License Keys.

Table 18 VCX Licensing Commands (continued)

Command	Description
vcx-licensequery	Displays information about the currently installed VCX software license, for example, serial number, customer name, and expiration date. Requires one of the following arguments: ■ **help** — Displays command syntax information. ■ **validate** — Indicates whether the license key has been successfully validated. ■ **machine-identifier** — Displays the machine id. ■ **system-release-version** — Displays the currently running version of VCX software. ■ **issuer-name** — Displays the name of the company issuing the license, in this case, 3Com Corporation. ■ **customer-name** — Displays the name of the customer. ■ **customer-address** — Displays customer address information. ■ **account-number** — Displays the customer account number. ■ **expiration-date** — Displays the expiration date of the original license key. ■ **update-expiration-date** — Displays the expiration date of the updated license key. ■ **license-capacity** — Displays the number of supported phones, IP Messaging clients, and conferencing clients. ■ **all** — Displays information for all of the arguments.
vcx-licenseinstall	Installs a VCX software license key on a host machine. See Installing a License Key File.

Table 19 lists commands you can use to view version information of various VCX software components.

Table 19 VCX Version Information Commands

Command	Description
vcx-showversion	Displays the currently running version of VCX software. See Verifying Software Versions.

Table 19 VCX Version Information Commands (continued)

Command	Description
vcx-showphone softwareversion	Supports the following arguments: ■ **devapp** — Displays the version of application software running on telephones connected to the system. ■ **devboot** — Displays the version of boot software running on telephones connected to the system. If neither argument is specified, the command returns both the application software version and the boot software version.
vcx-showcomponents	For VCX versions 7.1 and higher, when entered with no arguments, displays a list of the components (and their versions) which make up the currently active VCX software. Optionally, you can use the argument `--version=<`*`VCX-version`*`>`. When you specify a version, the command displays the installed components that match the specified VCX version.
vcx-showconfigtype	Displays the type of VCX configuration running on the machine. Possible returned values include: ■ **all** — Indicates the host system is running as an IP Telephony and IP Messaging Server. ■ **softswitch** — Indicates the host system is running as an IP Telephony Server. ■ **ums** — Indicates the host system is running as an IP Messaging Server. ■ **callserver** — Indicates the host system is running as a Call Server. ■ **dataserver** — Indicates the host system is running as an Authentication and Directory Server. ■ **bss** — Indicates the host system is running as a Call Records Server. ■ **adhoc** — Indicates the host system is running as a dedicated Conference Server.
vcx-listversions	For VCX versions 7.0 and higher, lists all the versions of VCX software installed on the machine. See Verifying Software Versions.

Table 20 lists miscellaneous system commands.

Table 20 Miscellaneous System Commands

Command	Description
vcx-sysinfo	Displays system information, for example, host name, serial number, networking information, and disk information.
vcx-ups-setup	For VCX versions 7.1 and higher, configures UPS monitoring on the machine. See Adding UPS Support to an Existing VCX System.
vcx-ups-status	For VCX versions 7.1 and higher, displays UPS status on the machine. See Monitoring UPS Status.

F Call Processor Command Line Interface Commands

This chapter contains a complete listing of command line interface (CLI) commands available for managing the call processor.

This chapter includes the following topics:

- Call Processor CLI Overview
- CLI Command Descriptions

Call Processor CLI Overview

The call processor can be configured from the server where the call processor was installed by using the remoteCLI application.

CAUTION: *Consult with your authorized 3Com technical support representative before using the remoteCLI application to reconfigure a call processor. Incorrect use of this application can render the call processor inoperable.*

The remote CLI application is located in the following directory:

```
/opt/3com/VCX/callprocessor/remoteCli/bin
```

The remoteCLI application requires either console or SSH access, using the *root* account, to the server hosting the call processor you want to manage. The commands in the following example log in to a call processor, change to correct directory, and start the remoteCLI application:

```
ssh root@<ip_address>
password:
cd /opt/3com/VCX/callprocessor/remoteCli/bin
./remoteCli -callp
>
```

The application uses the same editing style as the text editor *vi*. The CLI interface provides a complete view of all of the system configurable parameters and allows you to configure those parameters in real time. The configuration are automatically written to the configuration file (nmdb.xml) to maintain the configuration between application restarts.

The Remote CLI application retains 50 commands in its history, which can be displayed using either the up or down arrows of the keyboard. The Remote CLI application is not case sensitive and commands can be truncated as long as they are still uniquely identified; otherwise, it will use the first variable listed alphabetically.

For example, the following shows two ways to enter the `config` command:

```
> config CcTrusted RowStatus=4 Index=1 TrustedAddress=<IP
address>
```

or

```
> conf cct row=4 index=1 trustedaddr=<IP address>
```

You can enter the `help` command at the remote CLI application prompt (`> help`) to display a list of application commands. You can enter a command without a parameter to display a list of available parameters, for example:

```
> show

   AcctCfg
   AcctLogFilters
   AcctServer
   AcctServerStats
   AcctServiceStats
   AdhocServer
   AppCmd
   AppId
   AppMibs
   AuthCfg
   AuthLogFilters
   AuthServer
   AuthServerStats
   AuthServiceStats
   CcCfg
   CcLogFilters
   CcQosCfg
   CcQosMonitoredEndpoints
   CcStats
   CcTrusted
   LogCfg
   SipCfg
   SipLogFilters
```

CLI Command Descriptions

The remote CLI application uses the following commands for administering the Call Processor:

Table 21 Remote CLI Command Descriptions

Command	Description
exit	Quits the Remote CLI application.
shutdown	Shuts down the Call Processor gracefully.
version	Shows the software version of the Call Processor and the version of the Distributed Message Routing (DMR) 3Com proprietary protocol.

Table 21 Remote CLI Command Descriptions (continued)

Command	Description
show	Lists all of the Call Processor tables that are used for configuration. Use the command with a table name as a parameter to view details of that table.
config	Lists all of the configurable tables. Use the command with a table name as a parameter to configure that table.
diagnostic	Allows a user to make run-time only modifications to log levels.
exec	Causes a plugin to execute a plugin specific command. To display available commands for a plugin, issue the name of one of the plugins listed from the plugin CLI command along with the execute command.
statistics	Displays various types of counters for a particular plugin. To display available statistics for a plugin, issue the name of one of the plugins listed from the plugin CLI command along with the statistics command.
send	Sends a message to a plugin.
dump	Configures a plugin to display troubleshooting information.
messageTrace	Turns on logging for all DMR messages within the Call Processor. Note: Massage Tracing should only be used for short time intervals since it affects the Call Processor's performance due to unnecessary overhead.
help	Lists all of the possible commands that can be used, which are listed in this table.
plugins	Lists all of the plugin modules installed for the Call Processor.

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